SOUTHERN Aeronautics Flight

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With its highly supercharged 2,000-horsepower engine, the Navy's Vought Corsair operates at extremely high altitudes. From this commanding position, Corsair pilots are pouncing on the enemy with deadly effect.

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NORTH AMERICAN SETS THE PACE

...on the Training Fronts of the World

A SQUADRON OF NORTH AMERICAN AT-6 TEXAN TRAINERS "PEELING OFF" FROM ECHELON FORMATION

PILOTS OF 24 NATIONS TRAIN IN "TEXANS"

The most widely used trainer in the world today is the North American Texan, formerly known as the Harvard. More than 10,000 airplanes—believed to be a world's record—have been built in North American Aviation's trainer series. Twenty-four nations have chosen the Texan as their own combat trainer. Their wing insignia adorn this page.

In gunnery and bombing practice; in formation and instrument flying; in coast patrol and semi-combat duty the Texan has proved its versatility.

A pilot trained in a Texan is equal to any job in modern air war. He feels as much at home in a P-51 Mustang fighter or B-25 Mitchell Bomber as in a North American trainer. For the instrument panels and controls in all three North American planes have been specially designed to make the transition "painless" from trainer to fighter or bomber—helping give young pilots full confidence on their first flight in a heavier plane.

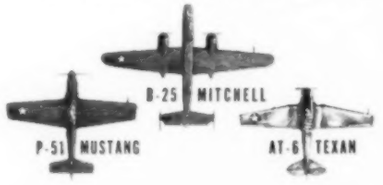
In the United States Army Air Forces almost every pilot of a fighter or bomber—whether single-engine or twin-engine—won his wings in a North American trainer. That's a mighty important fact that we, the men and women of North American, are proud of.

Free! Reprint of this page. Send postcard to North American Aviation, Dept. T, Inglewood, California.

NORTH AMERICAN AVIATION, INC.

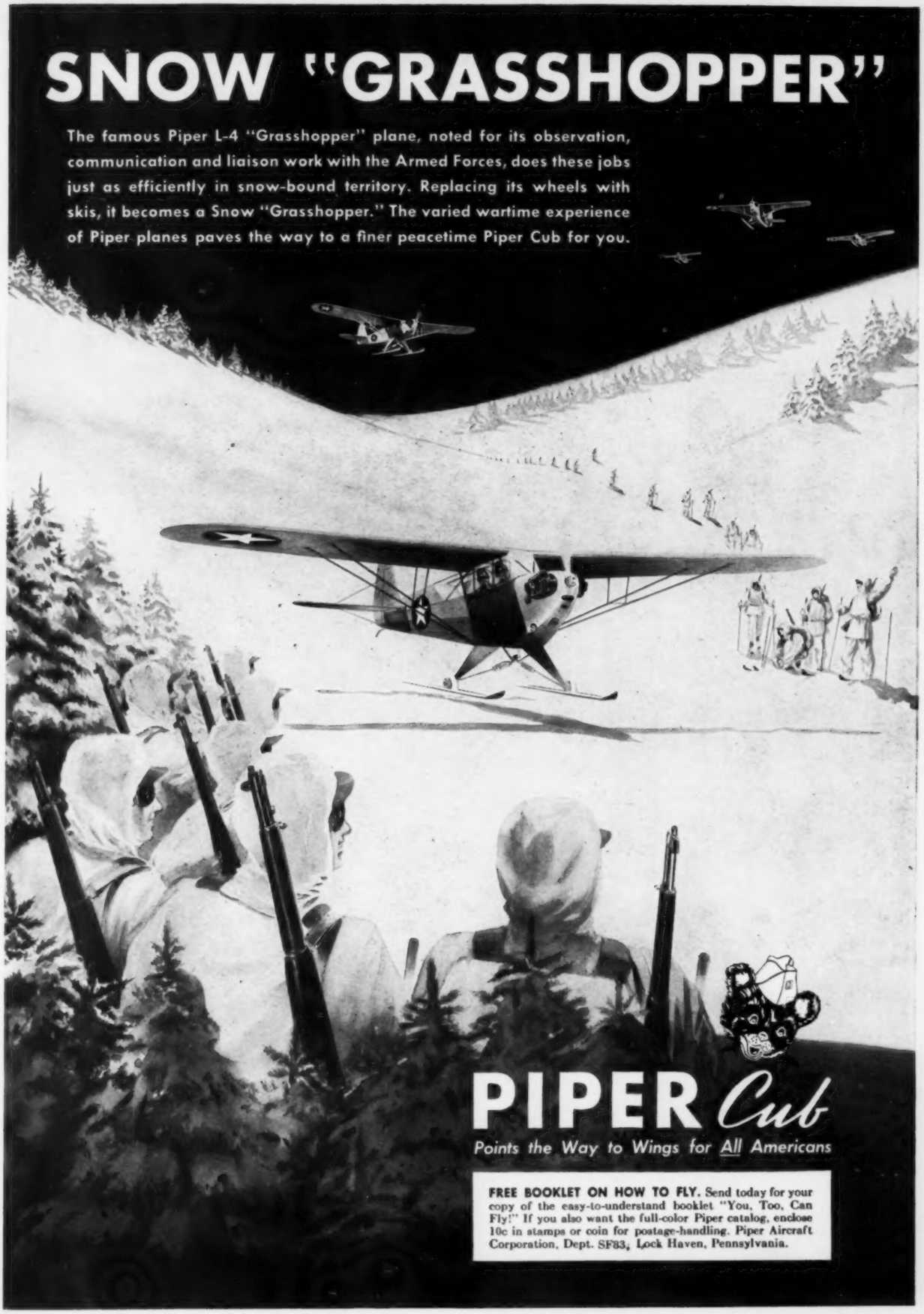
Inglewood, California
Dallas Kansas City

Member, Aircraft War Production Council, Inc.



SNOW "GRASSHOPPER"

The famous Piper L-4 "Grasshopper" plane, noted for its observation, communication and liaison work with the Armed Forces, does these jobs just as efficiently in snow-bound territory. Replacing its wheels with skis, it becomes a Snow "Grasshopper." The varied wartime experience of Piper planes paves the way to a finer peacetime Piper Cub for you.



PIPER *Cub*

Points the Way to Wings for All Americans

FREE BOOKLET ON HOW TO FLY. Send today for your copy of the easy-to-understand booklet "You, Too, Can Fly!" If you also want the full-color Piper catalog, enclose 10c in stamps or coin for postage-handling. Piper Aircraft Corporation, Dept. SF83, Lock Haven, Pennsylvania.

The Birdmen's Perch

A while back we got a Braintwister from Bob Harvey, of Fresno.

He even sent the answer!—so we put it in the Perch. (It was about a 100-mile round trip from A to B, with a headwind one way, a tailwind on the return.)

Well, it was probably the best Braintwister we've ever had, according to you Perch Pilots. There can't be more than 10 or 12 flyers left in the country who've not written to us . . . we got one letter from the *entire class* of an AAF school! We're *still* getting requests for the answer.

Congratulations, Bob Harvey, and may all your planes fly like fighters and handle like PT's. We hereby appoint you honorary Brainbuster for 1943.

Got any more?

Major Al Williams,
alias, "Tattered Wing Tips,"
Gulf Aviation Products Manager, Gulf Bldg., Pittsburgh, Pa.

CLEANING AND COMPRESSING

The Army Ordnance Field Service Division has a new wrinkle.

They call it the "dehydration of war weapons." Honest! But they don't squeeze water out of war weapons—they squeeze "dead" space. They cut corners on crates and boxes; they fit the containers to the weapons instead of the other way around; they ship vehicles disassembled with all the accessories jammed into the same box . . . they eliminate every possible cubic

inch of waste space. And this rearrangement results in increased efficiency in our lines of supply.

The Alchlor Process is a development in refining which eliminates the "waste" hydrocarbons from Gulfpride Oil. This super-refining technique is the most effective method for "eliminating" the impurities and unstable hydrocarbons (which cause oxidation and gum and sludge formation) from the oil. It even rearranges the molecular structure of certain of the hydrocarbons. And this rearrangement results in increased lubrication efficiency from Gulfpride.

BRAINTWISTER

(Twisted by J. B. Cunningham, Reno, Nev.)

Half the planes of a formation, plus one half a plane more than half, were forced down on the first leg of a flight. Half of the planes left, plus one half a plane more than half, were downed on the second leg. Half of the planes left, plus one half a plane more than half, were downed on the third leg. Half the planes left, plus one half a plane more than half, were downed on the last leg. One plane arrived at the final port.

How many started? Write for the answer.

G.L.S.E.—THE MAN WHO OILS THE WAR EFFORT

We've told you from time to time about how various war plants have stepped up production on war needs by making use of the proper Gulf lubricants, cutting oils, quenching oils, etc.

In many of these plants, the increases in quantity and quality were due to the counsel of the Gulf Lubrication Service Engineers.

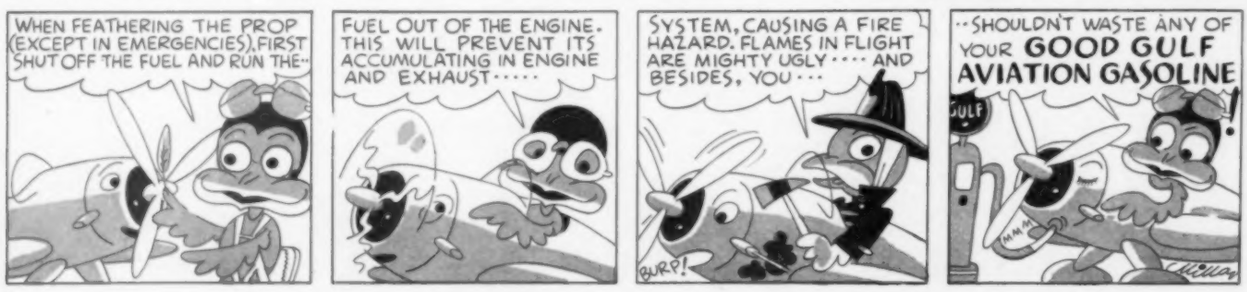
These men combine petroleum knowledge with broad experience in industrial production and maintenance and are prepared to help you find the answer to *any* lubrication problem. They are available to every plant, mine and industrial operation in 30 states, from Maine to New Mexico.

Interested?

Gulf Oil Corporation and Gulf Refining Company...makers of

GULF **GULF AVIATION PRODUCTS**

OIL IS AMMUNITION—USE IT WISELY

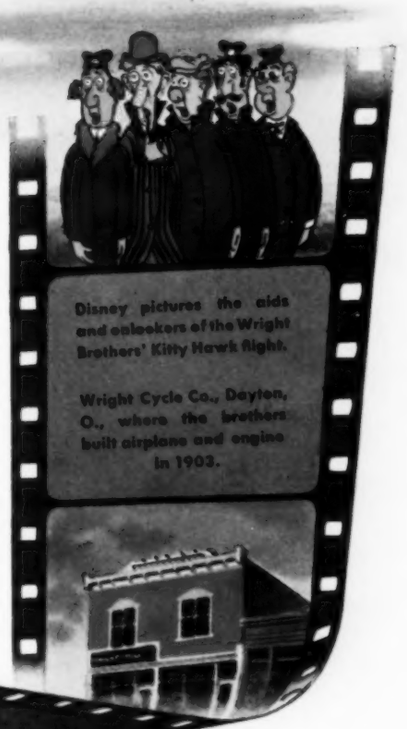

WHEN FEATHERING THE PROP (EXCEPT IN EMERGENCIES), FIRST SHUT OFF THE FUEL AND RUN THE··
FUEL OUT OF THE ENGINE. THIS WILL PREVENT ITS ACCUMULATING IN ENGINE AND EXHAUST·····
SYSTEM, CAUSING A FIRE HAZARD. FLAMES IN FLIGHT ARE MIGHTY UGLY···· AND BESIDES, YOU···
BURP!
··SHOULDN'T WASTE ANY OF YOUR GOOD GULF AVIATION GASOLINE!
GULF

The Five Witnesses Were Too Amazed to Cheer

THE WRIGHT BROTHERS knew their machine would fly. But the five witnesses, unaware of the painstaking study and experiment which had gone into the plane, were too amazed to cheer.

The comprehensive research program which brought initial success has characterized all subsequent Wright development. In the modern Cyclone engine it has made possible greater power for less weight, space, and fuel than is produced by any other type of powerplant.

The story of Wright is the story of flight as shown in Walt Disney's "Victory Through Air Power". Now, as in the past, Wright supplies the engines for the fastest and most powerful military and transport aircraft. For the even larger and more efficient planes now under construction, Wright is again providing the power.


Disney pictures the aids and onlookers of the Wright Brothers' Kitty Hawk flight.
Wright Cycle Co., Dayton, O., where the brothers built airplane and engine in 1903.

LIGHT · COMPACT · POWERFUL

Wright

ENGINES

WRIGHT POWERS THE TONNAGE OF THE AIR

AMERICA'S RADIAL AIR-COOLED DIESEL ENGINE

Family flying must be *safe* flying and safe flying must be *fire-safe!* The Guiberson, using fuel that will not burn even when exposed to flame, eliminates the fire-hazard from the power plants of planes, of tanks, of light ships. Weighing approximately 2 lbs. per horsepower, the Guiberson air-cooled radial diesel is America's *safest dependable* power for high-speed transportation. Today Guiberson powered equipment is hitting the Axis on the battle lines of the world and is ready to serve American industry on land, on sea and in the air.

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Aircraft and Heater Division
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Dallas, Texas Chicago, Illinois

Southern Flight

The only complete monthly digest of aeronautics in the South and Southwest

AUGUST, 1943 VOL. XX, NO. 2

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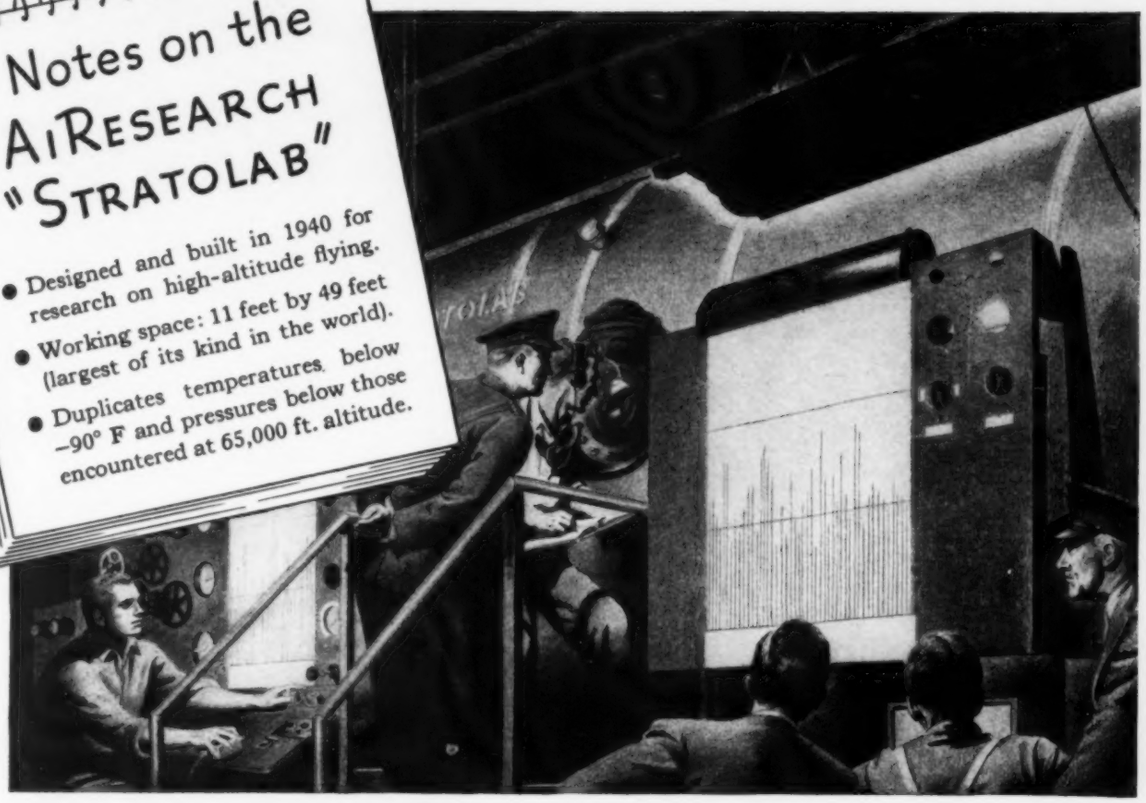
Notes on the AiResearch "Stratolab"

- Designed and built in 1940 for research on high-altitude flying.
- Working space: 11 feet by 49 feet (largest of its kind in the world).
- Duplicates temperatures below −90° F and pressures below those encountered at 65,000 ft. altitude.

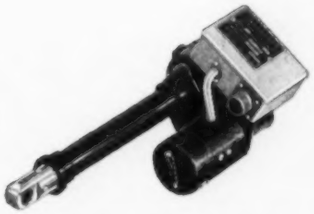


FROM this "Stratolab" have come important aviation discoveries: A newer knowledge of the reaction of metals to temperature variations... methods for controlling temperatures and air pressures to improve engine performance and crew comfort. Plus automatic control equipment that makes American airplanes superior in whatever climates and at whatever altitudes they fly.

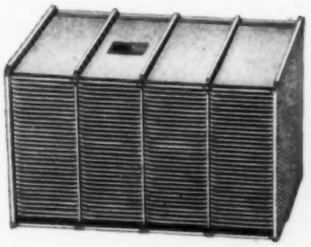
Here, AiResearch engineers have perfected such developments as—

RESTRICTED

A NEW-TYPE OIL COOLER THAT *CAN'T* CONGEAL



A SYSTEM OF *AUTOMATIC* EXIT FLAP CONTROL



AN *ALTITUDE-RAISING,* LIGHTWEIGHT INTERCOOLER

TODAY the AiResearch "Stratolab" is used largely for military purposes. After the war, it and AiResearch's air control engineering experience will be available to all aircraft designers and manufacturers. Inquiries are invited now.

AiResearch
MANUFACTURING COMPANY
LOS ANGELES · PHOENIX
DIVISION OF THE GARRETT CORPORATION

"Where Controlled Air Does the Job" • Automatic Exit Flap Control Systems • Engine Oil Cooling Systems • Engine Air Intercooling Systems • Exhaust Heat Exchangers • Supercharger Aftercooling Systems • Engine Coolant Systems

THE SKY IS NO LIMIT

There is only one way for any builder of an airplane engine to approach his job, and that is to make each part as fine as he is able to make it. ★ But in achieving this goal, Allison started with two special advantages. ★ One was the opportunity of drawing upon all General Motors' "know-how" in the perfection of manufacturing techniques. ★ The other was a privilege which had been ours for many years—the privilege of concentrating on assignments calling for high skill and precision in working with metals. ★ Perhaps we are aiming high, but with two such advantages it is natural our aspiration should be to seek to build ever finer aircraft engines.

LIQUID-COOLED AIRCRAFT ENGINES

POWERED BY ALLISON
P-38 — Lightning
P-39 — Airacobra
P-40 — Warhawk
P-51 — Mustang

Allison

DIVISION OF GM GENERAL MOTORS

THE "INSIDE" STORY OF STREAMLINES

An airplane engine's cowling has more to it than the sleek metal fairing that meets the eye. In front of the fire-wall . . . up where the "horses" are — cowlings, cowl wells, muffs, heat exchangers and anti-monoxide exhausts are stars in the Solar system. On all air battle fronts, the "inside" story of *streamlines* . . . of efficiency, heating, and safety, too, is often the coordinated assembly of vital Solar equipment in fighting planes.

ARMY NAVY

SOLAR

EXHAUST SYSTEMS—

SOLAR AIRCRAFT COMPANY ★ SAN DIEGO 1, CALIFORNIA

SOCIETY:
ZEKE MILLERS VISIT SHANGRI-LA
(Special by Radioelectronophone)
Residents of our city have received word that the popular Mr. and Mrs. Zeke Miller, of 1946 Main Street, who left town several days ago, are now enjoying the sights and sounds of Shangri-La.
As usual, the Millers are taking a "flying" vacation and expect to be at home again next week, after visiting several other places of interest along their air route.

In the tomorrow that is nearly today,

you, too, will casually vacation in spots that could

not even be found on the map

yesterday. Your world will grow immeasurably as the airplane

turns miles into minutes, continents and oceans

into hours.

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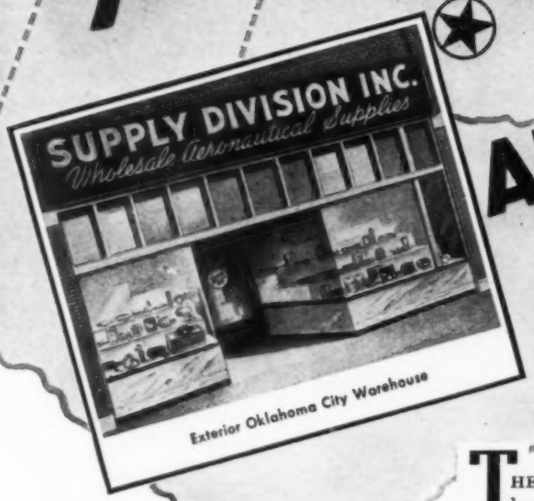
Now! Two Ports of Call for AIRCRAFT PARTS

ST. LOUIS

OKLAHOMA CITY



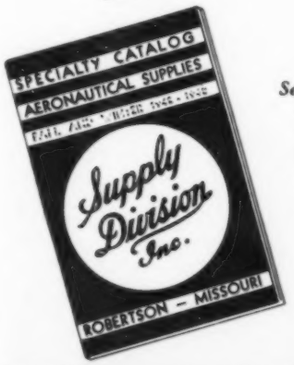
Exterior Oklahoma City Warehouse

THE opening of another Supply Division, Inc. warehouse — this one at Oklahoma City — means better-than-ever parts service for Aircraft Dealers of America.

Headquarters of this Company at Lambert Airport, Robertson, Missouri, was established more than ten years ago to provide a complete, convenient, central source of aeronautical supplies for Dealers everywhere—to serve literally as their "Warehouse Annex" from which every conceivable type of accessory and engine part could be obtained *fast*. The growing volume of business resulting from steadily increasing patronage of this service has made necessary the present expansion of distributing facilities.

Office and Sales Room Oklahoma City Branch

So now, when you need *any* item or specialty, phone Supply Division, Inc. branch nearest you . . . Terryhill 5-2902 (St. Louis) . . . 3-6224 (Oklahoma City). Your order, irrespective of size, will receive prompt and understanding attention . . . and will be shipped immediately —by air express, when required.



Send for a copy of this new Specialty Catalogue

SUPPLY
Division Inc.
LAMBERT AIRPORT, ROBERTSON, MO.

YOUR *"Warehouse Annex"* FOR AERONAUTICAL SUPPLIES

JUST AMONG OURSELVES ★ *Editorials and Comment*

IT was probably Senator Truman's intention to convey to the public the impression that the United States Senate is maintaining close watch on war industries, especially those engaged in aircraft manufacture. The people, of course, expect this of the Senate. It's their money the Senate is appropriating in amounts of billions per unit. It's their liberty which is at stake on the battlefronts.

We're one hundred per cent for the Senate's vigilance, not only over war industries but over war agencies and war policies.

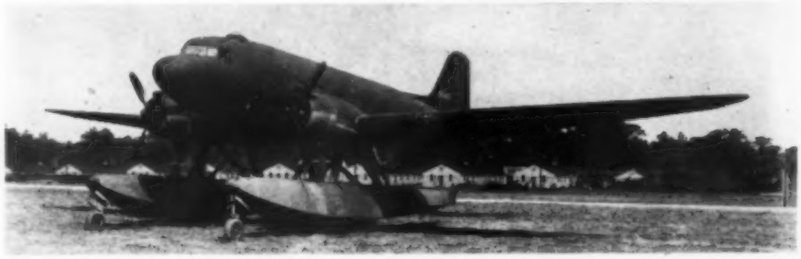
But we also want the Senate and its Committees to stick to facts in reporting their views and alleged findings, particularly when those facts pertain to aviation. We ourselves have found this a difficult task, for aviation is spectacular, a challenge to the equilibrium of those who would make its acquaintance. But by and large we managed to learn that facts do exist in aviation—cold, hard, unswerving facts which sooner or later make themselves apparent, personal ideas and theories to the contrary notwithstanding. Some of these facts have been overlooked by Senator Truman's vigilantes.

The Truman Committee's report alleges, among other things, that the Wright Aeronautical Corporation has turned out some defective engines. We don't doubt this at all. There have always been, and will continue to be, a defective engine here and there, especially during mass production runs, and particularly among engines of combat horsepower ratings. The simple fact is that the demands of war do not allow sufficient distinction between creative engineering and mass production—we no sooner manage to squeeze a thousand horsepower into an engine than we find we need fifteen hundred, and by that time two thousand horsepower is the order. Meanwhile we encounter critical shortages in materials and manpower, and substitutions and simplification are forced upon us, not to mention constant design changes affecting the airplane itself and its hundreds of accessories.

But we do question the Truman charge that the Wright Aeronautical Corporation has caused defective engines to be accepted by the military services. In this matter we haven't personal access to the facts. But we don't believe a going concern like Wright, which has been with us for many years and whose stockholders expect continued operations in the imminent Air Age, would go as far as the Truman Committee alleges. Moreover, to accuse Wright of causing defective engines to be accepted by the government is also to accuse the government's agents and the military department. This is serious. It involves not only morale on the production front but on the fighting front, too. In time of war, crimes such as alleged by the Truman Committee cease to be civil violations and become sabotage, which can and must be ferreted out with severity. The Army and Navy maintain strong safeguards against sabotage, and it is not reasonable to believe our combat forces have been jeopardized in the manner alleged by the Truman Committee.

There are other weaknesses in the Truman report, unsupported by recognized facts. The most glaring concerns the criticism of the Martin Mars, which the Committee considers "worthless" and which, the Committee boldly states, has "not yet been put to any important practical use." Even the bitterest critic of flying boats would hardly call the Mars "worthless." Glenn L. Martin, one of the world's leading aircraft pioneers, has answered this with facts unlikely to be challenged successfully. The Mars' major fault, says Mr. Martin, is in its engines, which are government furnished equipment. Its engineering record shows that in eighty-five hours of flying it has proved it can carry more weight for greater distances than any other airplane in existence, and that it is the most efficient aircraft per pound of material, per horsepower and per gallon of fuel yet known. Personally, we're going to rely on Mr. Martin's engineering records for the time being.

Somewhere along the way of good intentions, the Truman Committee seems to have strayed. Its report certainly cannot be interpreted as wholly factual. Perhaps, as with many another well-intended aviation report, the lure of sensationalism was too strong.



—AAF Materiel Command Photo.

The Army has attached amphibious floats to Douglas C-47 transports. They can taxi to shore, climb onto the beach and rescue air crews stranded on South Pacific Islands.

Revving Up

SNEFU DEPT.: One of our faithful readers offers a suggestion for the postwar flying world that we're glad to pass on to you for whatever it might be worth. "I was mad as hops," he writes, "when they shut down private flying on the Pacific Coast and hit the ceiling when they extended the ruling to the Atlantic Coast. Now I find I was all wet. When I head out for one of the larger coast line cities I leave my airplane on a small field about 150 miles from the destination and board a fast train. I find that this procedure not only gets me into the heart of the city much faster, thereby saving much time, but one doesn't have to undergo the indignities generally suffered at the big city airports where the civilian pilot is persona non grata. Why not prevail upon the authorities to continue their present ruling after the war, purely for the purpose of enhancing the practicability of privately owned aircraft, at least until such time the Greyhound Bus Line people get going on their helicopter service?"

★ ★ ★

CAMPAIGN FOR JOINERS: We don't know whether the Cessna

(Continued on page 24)

POWER TO WIN

The absolute dependability of Continental Red Seal Engines is providing POWER TO WIN for the vital missions of our air forces.

ARMY E NAVY

Awarded to the Detroit and Muskegon Plants of Continental Motors Corporation for High Achievement.

Your Dollars Are Power, Too! . . . Buy War Bonds

Continental Motors Corporation

Aircraft Engine Division

MUSKEGON, MICHIGAN

No. 1 on the Hit Parade

"WORDS AND MUSIC" BY DOUGLAS EMPLOYEES

Dedicated to the Flight Crews and Ground Personnel of the United Nations

THE "Hit Parade of the Centuries" is on the march down the skyroad of retribution that stems from this nation's aircraft production lines. With the mounting fury of our offensive, each bomb that hits its Axis mark is one more note in the dirge to be finally titled, "Unconditional Surrender."

Leading the nation in quantity, quality and types of warplanes produced are more than 150,000 loyal men and women of Douglas. In six mammoth plants, strategically located from the Great Lakes to the Pacific Coast, their craftsmanship and devotion to duty back up the skill and daring of the men who fly Douglas-built airplanes on every front.

United Nations fighters and Douglas workers make up a Victory Chorus in whose score are heard the roar of dive bombers and attack bombers; the thunder of great four-engine long range precision bombers; the drone of cargo and transport aircraft that are day and night "carrying the Ax to the Axis."

No pretty tune for our enemies, but an inspiration of hope and assurance of liberation for the world!

DOUGLAS

AIRCRAFT COMPANY

SANTA MONICA, CALIFORNIA

LONG BEACH, CALIF. ★ EL SEGUNDO, CALIF.
CHICAGO ★ TULSA, OKLA. ★ OKLAHOMA CITY

MEMBER, AIRCRAFT WAR PRODUCTION COUNCIL, INC.

SANTA MONICA

Here at Douglas headquarters, tens of thousands of diligent men and women are working around the clock turning out record numbers of A-20 "Havoc" Attack Bombers and C-54 "Skymaster" Combat Transports.

EL SEGUNDO

The men and women of Douglas at El Segundo are proud Army-Navy "E" Award winners for outstanding production of SBD and A-24 "Dauntless" Dive Bombers—the planes that have borne the brunt of the fight in the Pacific.

LONG BEACH

Here in one of the world's largest, most modern aircraft plants, production lines are humming, turning out famed C-47 "Skytrains," C-53 "Skytroopers" and B-17 "Fortresses."

TULSA

Douglas is the only manufacturer of both types of American four-engine bombers. At Tulsa the production of B-24 "Liberator" Bombers is swelling as a rising tide. Tulsa is also contributing its full share of deadly A-24 "Dauntless" Dive Bombers.

OKLAHOMA CITY

Douglas leads the nation in building vitally needed cargo and troop transport airplanes. The Oklahoma Plant is devoted to the exclusive production of C-47 "Skytrains" and C-53 "Skytroopers."

CHICAGO

Located at the future "crossroads of the world." Douglas at Chicago will soon be turning out huge four-engine C-54 "Skymaster" Combat Transports at a yearly rate exceeding all transports in world airline use before Pearl Harbor.

Stalingrad Story

Your children's children will thrill to the story of Stalingrad.

—of the besieged, battered, hopeless city that was saved by white hooded infantrymen crawling on their bellies in swirling wastes of snow.

—saved by heroic ground forces whose magnificent air support never failed them.

Bell Airacobras, roaring over the Stalingrad front, gave wings to artillery. Above the masses of men and tanks locked in combat on the ground, they hunted out the enemy's vital spots—blasted them at short range with explosive and armor piercing cannon shells. Providing air support for ground troops is a job the Airacobra does superlatively well.

Here's the significant point. Airacobras were there in force when they were needed. We're able to deliver planes for action now *when they're needed* in this global war, because we started early enough, planned well enough and pushed production hard enough.

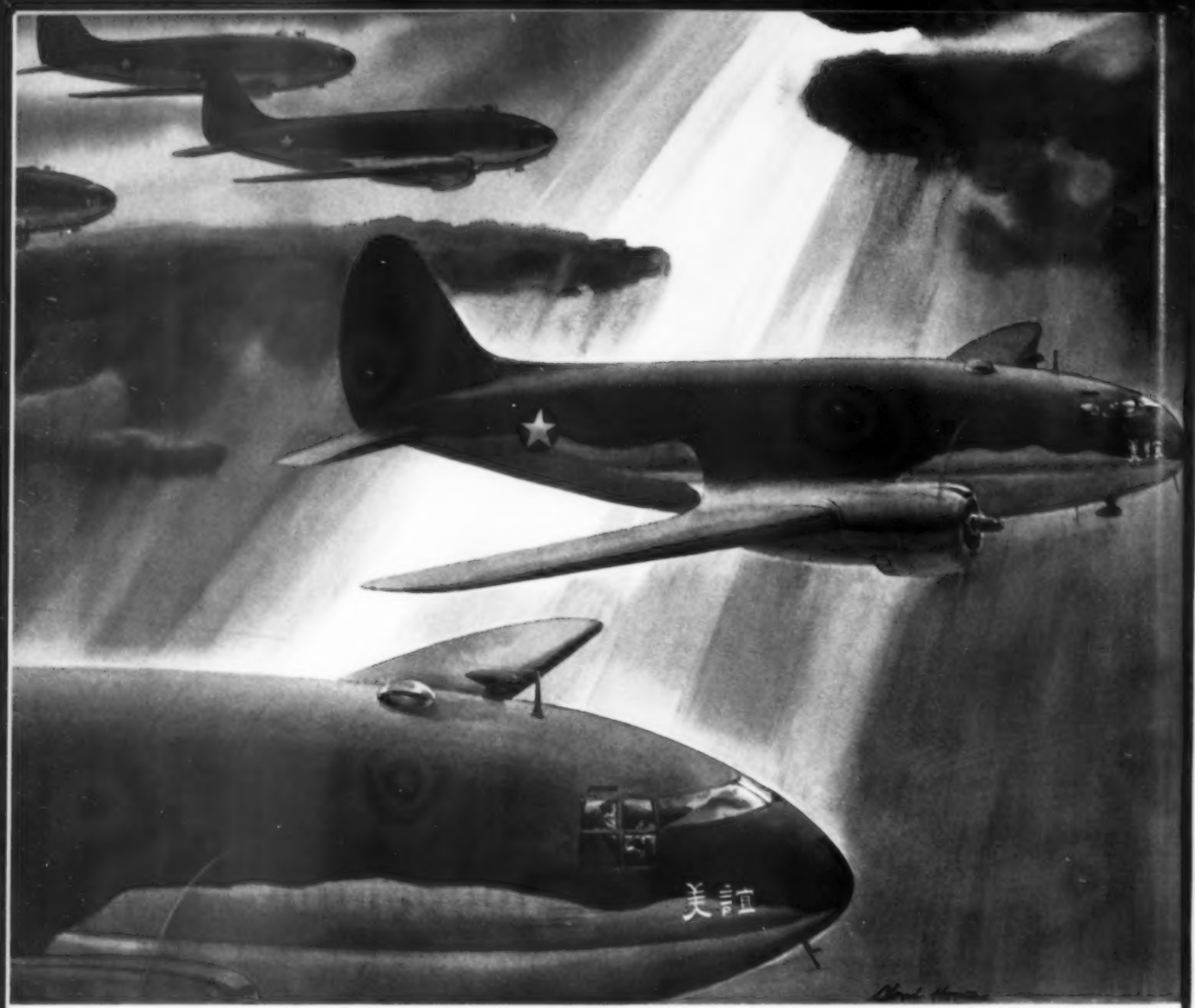
After victory we'll be telling you about new Bell planes, planes of peace. What will they be like? Well, they'll be designed, engineered and built by an organization that makes a habit of aviation pioneering. © Bell Aircraft Corporation, Buffalo and Niagara Falls, New York.

Airacobras for victory—

FUTURE PLANES FOR PEACE

BELL *Aircraft*

PACEMAKER OF AVIATION PROGRESS



HISTORY'S *Greatest* MASS FLIGHT

Not until the war is over and the need for secrecy is ended can the full importance of this achievement be realized. All that can be told today is that a large number of giant Curtiss Commando Transports in mass flight have spanned 15,000 miles of ocean and the land of three continents to complete the longest mass flight in history.

From an unrevealed starting point in the continental United States, they delivered without incident, *ninety tons* of cargo and a large group of military personnel in the time of *four and one half days.*

We salute the pilots, the crew and the ground organization of the Army Air Forces and Air Transport Command whose excellent performance made this flight possible. We, of Curtiss-Wright, know that this is but the beginning of a history making epic which will again prove the dependability, serviceability and cargo capacity of the Curtiss Commando.

CURTISS-WRIGHT
Corporation
AIRPLANE DIVISION

Member: Aircraft War Production Council, East Coast, Inc.

FIRST
Since the Birth of Aviation

CURTISS *Commando*

FOR CARGO AND COMMERCE

9 CADETS

90- Organization

0. The Civil Air Patrol Cadets (CAPC) were established October 1, 1942, by order of the CAP National Commander authorizing a grade of CAP membership designated as "Cadet" and junior to regular membership in CAP. Purpose of CAPC is to extend the benefits of CAP training to young men and women and thus develop pre-trained personnel for CAP and other Federal services.

1. CAPC will be governed by the same rules as CAP except as modified in (9).

2. CAPC is a local program. Pursuant to (01-6), and in addition to the Squadron or Flight composition authorized in (05) and (06):

1 A CAP Squadron may establish 1 Squadron, Flight, or Section of CAPC.

2 A CAP Detached Flight may establish 1 Flight or Section of CAPC.

3. Until at least six months after the formation of a CAPC unit, its membership will not exceed the number of active members in the CAP Squadron or Flight to which it is attached, unless the Wing Commander approves a shorter initial period. Thereafter, a CAPC Squadron may be expanded to a maximum of 200 Cadets; a CAPC Flight to a maximum of 60.

1 It is recommended that CAPC recruiting be undertaken at the beginning of the regular Fall and Spring scholastic terms and of the Summer vacation so the CAPC program will coincide with that of the local schools.

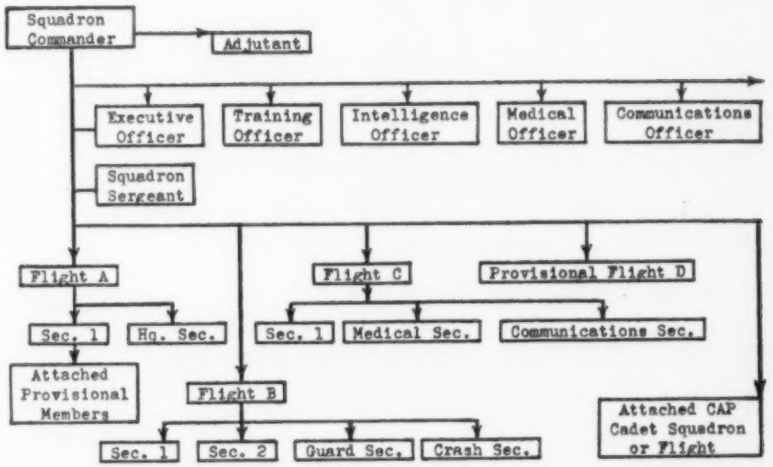
4. The CAPC unit will bear the name of the CAP unit to which it is attached. Example: Baltimore Cadet Squadron, Md.; Cadet Flight, District of Columbia Squadron.

91- Personnel

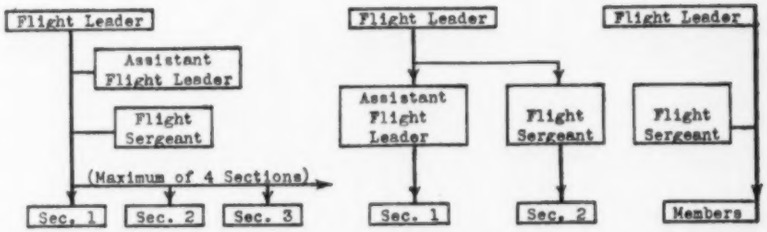
0. To concentrate the Cadet program in the pre-draft ages, membership will be limited to students in good scholastic standing in the last two years of senior high school who are physically fit for duty in the Armed Forces and whose parents or guardians meet the citizenship requirements for CAP membership. A CAP Cadet will hold membership in a CAPC unit; not in CAP or in CAPC as a whole.

1. Applications for membership will be submitted to the local CAPC unit in duplicate on prescribed forms, with three full-face passport photos, 1½" x 1½", unsmiling, without hat; and with written consent from parent or guardian to the applicant's service in CAPC. The CAPC unit will keep one copy of the application and one photo. The other items will go to the CAP unit.

2. Each applicant will take the following oath: "As a native-born citizen of the United States, I wish to serve my country by helping build aviation in America and training myself in aviation. I pledge that I will perform my duties faithfully in the Civil Air Patrol Cadets, attend all drills and classes, obey the orders of my superior officers, wear my uniform in a military manner, keep alert at all times, and complete my training as rapidly as possible so that I may prepare myself for membership in Civil Air Patrol."



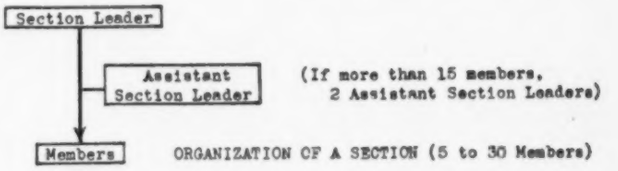
TYPICAL SQUADRON (50 to 200 Members)



LARGE FLIGHT (26 to 60 Members)

MEDIUM SIZE FLIGHT (15 to 25 Members)

SMALL FLIGHT (10 to 14 Members)



(If more than 15 members, 2 Assistant Section Leaders)

ORGANIZATION OF A SECTION (5 to 30 Members)

13- Investigation (Continued)

2. On receipt of an application by National Headquarters, the fingerprint card will be referred to the Federal Bureau of Investigation and the applicant's references will be checked. In event of an adverse report, National Headquarters will advise the local unit commander directly in the case of an applicant or through channels in the case of a member. Such applicant or member will be excluded immediately from CAP activities and will not be reinstated without approval of the National Commander.

3. While an applicant is serving as a provisional member, the unit commander will investigate him thoroughly. (23) On adverse findings, the applicant will be dropped from provisional membership immediately and the unit commander will advise National Headquarters directly with brief notes as to the circumstances.

14- Identification

0. Identifications will be furnished to members and will be carried by them at all times when in CAP uniform or participating in CAP activities. Identifications will be government property; will be shown on demand; and on the resignation or discharge of a member, or by order of the National Commander, will be surrendered to the CAP unit commander on demand.

1. A provisional member will be given a credential signed and dated by his unit commander as follows: "This will certify that (name and address) has applied for membership in Civil Air Patrol and is accepted for training by (name and unit) of CAP, pending action on the application. This authority expires 90 days from date." In the case of a member of the Armed Forces, or a civilian awaiting induction, attached to a CAP unit for training without applying for CAP membership, a credential may be furnished with the underlined words omitted.

2. After a provisional member has served at least one month and has completed the training (17) required for Rating 1, a board of officers will hold oral examination as to his qualifications and desirability, and will impress upon him the nature of his obligations. On satisfactory examination, the unit commander will execute a rating sheet (17) in duplicate, keep one copy, and send the other directly to National Headquarters whence an identification card will be issued bearing the member's name, address, picture, CAP serial number, and signature. Only this card will constitute evidence of membership in CAP.

3. National Headquarters will send the Wing Commander the card for transmittal through channels to the local unit commander, and a duplicate of the member's application for Wing files. Transmittal of the duplicate application will constitute assignment of a member to a Wing and transmittal of the card through channels will constitute assignment to a local unit.

4. While awaiting transmittal of his card, the member will complete the training (17) required for Rating 2 and on satisfactory examination will appear in correct uniform before a meeting of the CAP unit and take the CAP oath. The unit commander will then present the identification card to the member.

5. An identification card will be valid for the duration of the war plus six months unless otherwise ordered by the National Commander. In case a member loses his card, the unit commander will send a rating sheet, passport photo, and explanation of the loss, signed by the member, directly to National Headquarters whence a new card will be sent through channels.

15- Changes

0. A member will remain attached to the unit to which he is assigned by the commander of the next higher unit, until transferred. Transfer may be effected by relief from duty with the unit, on application of the member to the unit commander or on order of a higher unit commander.

1. The following procedure applies to transfer to and from Wings, Groups, Squadrons, and Detached Flights. Transfer between Flights within a Squadron may be effected by the Squadron Commander and between Sections by the Flight Leader, without reporting to higher units. For operations units see (19).

1 The unit commander will execute two copies of a rating sheet covering all work completed by the member, will give the member one, and will send the other to Wing Headquarters, endorsing both "Relieved from assignment to (name of unit, date, and signature and title of commander)".

2 On reporting to a new unit in the same Wing, the member will give his copy of the rating sheet to the unit commander who will endorse the sheet, "Reported for duty (name of unit, date, and signature of commander)", and will report the reassignment and the member's new address to Wing Headquarters.

3 If the transfer is outside the Wing, the Wing Commander will forward the member's rating sheet and the duplicate of the original application to National Headquarters and advise, if possible, which Wing the member wishes to enter and the member's new address. On reporting for duty with a local unit, the member will give his copy of the rating sheet to the unit commander who will proceed as in (15-1.2). The Wing Commander will report the member's new unit and address to National Headquarters whence the duplicate application will be sent to the Wing.

2. A member temporarily absent from his unit may be admitted, without formal transfer, to activities of the unit where he happens to be. The unit commander will furnish him a signed statement as to any training courses completed, for entry on his rating sheet when he returns to his home unit.

3. A member assigned to CAP operations duty will be carried on the rolls of his regular Wing unit and will report to it for duty on relief from operations assignment. The member's functional assignment in the unit will be held open for him at least 90 days.

4. A member who is unable to remain active in CAP by reason of active duty with the armed forces, work in a war industry, prolonged illness, or absence from the vicinity of a CAP unit may retain membership in CAP. He may keep his identification card and participate in CAP meetings and training as in (15-2) but will be placed on an inactive status and relieved of CAP assignment and duties. The unit commander will execute a rating sheet in duplicate, endorsed "Inactive (reason for this status, name of unit, date, and signature of commander)", will give the member one copy, and transmit the other to Wing Headquarters. The Wing Commander will transmit the sheet, and the Wing file duplicate of the member's application, to National Headquarters. An inactive member will hold no title of function or rank in CAP and will not wear the CAP uniform. He may be restored to active status on discharge from military service, or on becoming able to be active again, by reporting for duty with a local unit whose commander will execute a rating sheet and proceed as in the case of the arrival of a transferred member (15-1).

5. A member who resigns or is discharged from CAP may be reinstated, except if dishonorably discharged, or honorably discharged without satisfactory service endorsement (16-1), as in the case of the arrival of a transferred member (15-1).

16b

1 **OH! TAKE US OUT TO THE BALL GAME**

When You're a Long, Long Way From Home (Home plate, of course)... far away from the ball park... what can you do but sing those *A Card blues?* Well, you can do a *lot* of worthwhile things instead... things that will help to win this war. Put yourself in this next picture and see what we mean...

2 ***If You Want Action, Here It Is.*** Ride the fire engines as an auxiliary fireman in the Citizens' Defense Corps. That's a volunteer job that's as much real fun as the best ball game you've ever seen... only this time *you're on the team,* helping to strike out Herr Hitler and his gang. Call your local Office of Civilian Defense about it now...

If you're Singing the A Card Blues

3 ***Tomorrow a 500-Mile Run Home*** will be an easy morning's drive. How? In your Cessna Family Car of the Air, of course. It's not like anything you ever see in the air today. And it's going to be as easy to fly as driving an automobile ever was. What's more it's real. It's here right now at Cessna, ready to be built for you as soon as this victory and peace are won.

Until then we're putting everything we've got into building Cessna Bobcats for Uncle Sam. But when peace comes you'll be going to the game wherever it is, from coast to coast... east, west, north, or south... whenever you want to, in your own Cessna Family Car of the Air.

COPR. 1943, CESSNA AIRCRAFT CO.

Cessna

Priority Delivery by Buying War Bonds Now... Be one of the first to own a Cessna Family Car of the Air after the war. Orders are bound to exceed production. But you can get a preferred listing for early postwar delivery. No obligation to buy. Costs you nothing. Write us today for the simple priority plan. CESSNA AIRCRAFT COMPANY, Box 1616-SF, Wichita, Kansas.

ARMY (E) NAVY Cessna

SYMBOL OF AIRCRAFTSMANSHIP FOR THIRTY-TWO YEARS

BUY WAR BONDS AND STAMPS

From a mysterious world

You are looking at men who are part of a group which has spent more time farther from this earth than probably any others who have ever lived!

They are Boeing flight engineers recording by camera and visual observation the readings on a maze of high-altitude test equipment. Extensive research at 35,000 feet and above is one of the reasons the Boeing Flying Fortress* is able to operate at higher altitudes under combat conditions than any other bomber.

Here is a world utterly alien to any which you know, a world of incredibly thin air and brilliant blue skies where weird things happen.

Radio plays strange pranks up there in the stratosphere. Engines lose their power. Oil turns to mush, and windshields sprout ice whiskers in the 67-below-zero temperature.

Yet these and many other problems have been solved so well by Boeing research that the Flying Fortress today performs in some respects even better 7 *miles up* than it does at sea level!

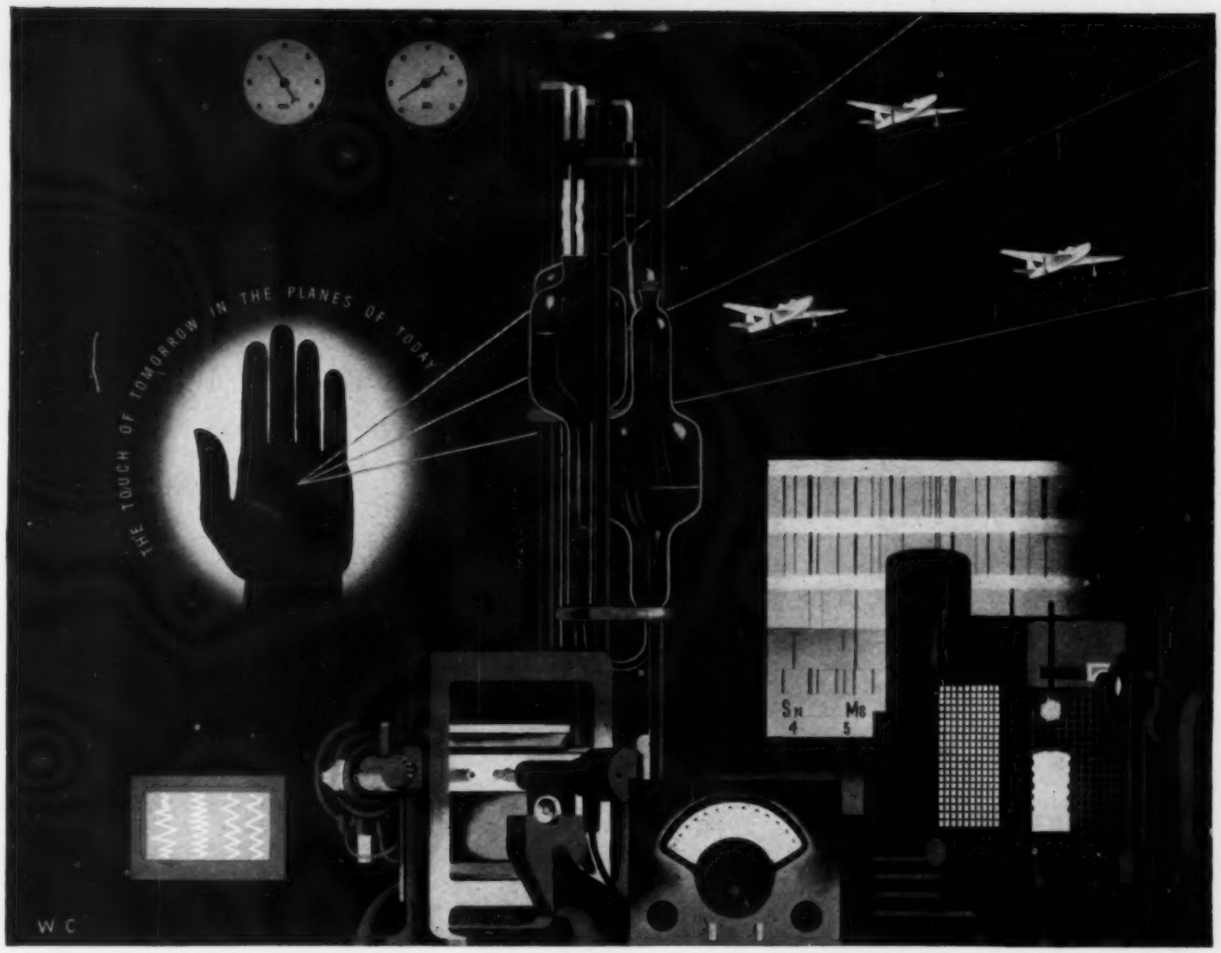
Probably *you* will never have occasion to travel at such extreme altitudes. But once the war is won you will fly swiftly and luxuriously at 20,000 feet and thereabouts . . . thanks in large measure to the pioneering done by Boeing flight test crews.

It is a characteristic of Boeing to do every job a little better than is required. In engineering, manufacture and performance, Boeing products have always exceeded the claims advanced for them.

It is true of the Flying Fortress today, and it will be true of many a new product tomorrow . . . if it's "Built by Boeing" it's bound to be good.

DESIGNERS OF THE FLYING FORTRESS • THE STRATOLINER • PAN AMERICAN CLIPPERS **BOEING**

*THE TERMS "FLYING FORTRESS" AND "STRATOLINER" ARE REGISTERED BOEING TRADE-MARKS



Organizing Atoms for a Better Aircraft Engine

A visitor at the Ranger plant once remarked: "Scratch a Ranger engineer and you'll find a scientist!" In creating the Ranger in-line, air-cooled aircraft engine, Ranger engineers began by concerning themselves with the very atoms of which its metal alloys are composed. They made use of scientific instruments and techniques unexcelled anywhere in the world in scope and precision. And the same advanced metallurgical and chemical laboratory facilities are today guarding the quality of Ranger materials in the rush of war-time production. Spectroscopic, chemical and X-ray analyses of materials and finished parts are as much a part of Ranger production as milling machines, turret lathes and grinders.

All Ranger engines are put through the acid test of actual operating conditions in scientifically equipped test cells. Ranger's experimental test cells can simulate flying conditions in temperatures as low as −70° F. and at altitudes up to 40,000 feet. Some of Ranger's tests on auxiliary devices are not duplicated anywhere in the aviation industry. In Ranger's "flying laboratory"—a tactical war plane fully equipped with scientific test instruments—pilots and engineers daily add new knowledge to all that has been discovered before.

While thousands of Ranger engines are turning in a remarkable record in the planes of the United Nations, Ranger engineers persist in researches which will make even more readable news tomorrow . . . except in Axis newspapers.

"ON THE BEAM"

"The independence and liberty you possess are the work of joint councils and joint efforts, of common dangers, sufferings and successes."

—Geo. Washington's Farewell Address

Buy U. S. War Bonds and Stamps

RANGER AIRCRAFT ENGINES

Division of Fairchild Engine and Airplane Corporation · Farmingdale, Long Island

Another Martin First!

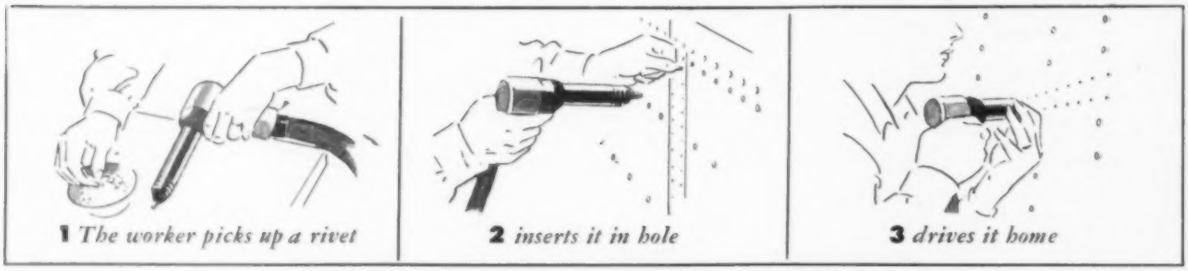
NEW MARTIN RIVET FEEDER CUTS RIVETING TIME 30%!

REDUCING riveting time on aircraft by 30%, this rivet feeder—a new Martin development—changes rivet guns from "single shots" to "automatics." Now undergoing work-tests, the feeder will soon be made available to all industry.

In the form of a magazine, attached to standard rivet guns, the feeder is operated by exhaust air which slides rivets forward, ready for the hole. With one movement of the gun, the worker puts the rivet in place; with another he drives it home. Picking up a rivet and inserting it by hand are eliminated; the worker's hands stay on the rivet gun until a clip is exhausted. Reloading consists merely of dumping rivets through a small door in the feeder.

In the driving of ice-box rivets, faster riveting means less time for rivets to warm up. Since they are untouched by the hand, they are cooler when driven home. The feeder costs nothing to operate, utilizing exhaust air from the rivet gun.

Suggested by a Martin inspector, it's an example of how Martin men and women work together to speed production. And it's an example of the leadership that makes Martin first in the factory . . . first in the air!



1 *The worker picks up a rivet* — **2** *inserts it in hole* — **3** *drives it home*

YESTERDAY 3 OPERATIONS

TODAY ONLY 2 OPERATIONS

Lower pictures show how the new device works. (*Left*) Without taking hands from gun, worker inserts rivet waiting at end of the track; (*Right*) drives it home. Results: Thirty per cent speedup in riveting, aviation's tightest bottleneck. *Warplants desiring further information write the Glenn L. Martin Company, Baltimore, Maryland.*

Martin AIRCRAFT

Builders of Dependable Aircraft Since 1909

400,000 RIVETS hold MARTIN MARAUDERS together even when shot up like this one flying home over Tunisia. The new rivet feeder, by cutting riveting time thirty per cent, will speed victory by speeding output of MARTIN MARAUDERS, BALTIMORES and MARINERS.

6,000 experts keep Lockheeds in trim!

WHEREVER there is a Lockheed *working* or *fighting*—there is a trained specialist nearby to keep it at its peak operating efficiency. 6,000 experts, trained by Lockheed, paid by Lockheed, are now scattered throughout the world testing, checking, repairing, even rebuilding the thousands of Lockheeds so active now in commerce and in war.

Huge repair bases dot three continents, equipped and capable of any job. Hundreds of Lockheed field service representatives are on fighting fronts, helping Army, Navy and R. A. F. repair crews get the planes back into the fight. Others are studying technical problems of operation and maintenance that may improve design or make upkeep easier.

Lockheed is investing time, effort and energy to build a service system—unexcelled. For by keeping dependable planes in dependable operation we will speed Victory and pave the way for the day when every Lockheed owner may fly where he pleases on the world's airways with confidence and surety.

LOOK TO *Lockheed* FOR LEADERSHIP

LOCKHEED AIRCRAFT CORPORATION, VEGA AIRCRAFT CORPORATION, BURBANK, CALIFORNIA, U. S. A.

THE 500 MILLIONTH GALLON
Somewhere on the global battle fronts or at one of the busy training fields here at home, the 500 millionth gallon of 100-octane Humble-Esso Aviation gasoline produced by *one* Humble refinery has gone into action. That is more 100-octane gasoline than has been produced by any other plant in the world—enough to fuel 1,000 giant bombers on 200 raids deep into enemy territory. But it's only part of the war job that Humble-Esso Aviation products are doing. Serving American planes and pilots are aviation engine oils, 91-octane gasoline, special instrument oils and stratosphere greases made by refineries that also are producing toluene for T. N. T., rust preventives for aircraft engines, and butadiene for synthetic rubber.
Esso
HUMBLE - ESSO AVIATION PRODUCTS
Today Humble-Esso Aviation Products serve the vital demands of war; tomorrow they will serve equally well the needs of peace.
100 OCTANE
GASOLINE
HUMBLE OIL & REFINING COMPANY

TRAINING ANOTHER AMERICAN CADET

To Pilot Sudden Death to the Axis!

GLOBE AIRCRAFT CORPORATION

FORT WORTH, TEXAS

Manufacturers of the AT-10 Advanced Trainer and the Swift GC-1.

REVVING UP

(Continued from page 12)

people originated the idea but three cheers to them for starting a campaign for changing the hackneyed term "Private Flying" to "Personal Flying." We bumped into Hank Kurt (now test flying Grumman Hellcats and holding down executive jobs with Grumman on Long Island), who vociferously agreed that Cessna has started something worth while. If we can get some good solid support from all you folks who are still carrying the torch for civilian flying we'll help put this brilliant idea into effect. We will sponsor the burial of "private flying" like David Low's interment of Britain's Col. Blimp and announce simultaneously the birth of "Personal flying" which packs a wallop and replaces negative connotation with positive meaning.

★ ★ ★

PROGRESS REPORT: The best train schedule between Dallas and Denver offers nineteen-hour service. But thanks to the CAB, Braniff Airways' new operation linking the two cities offers five and one-half-hour service. . . . Flying with American Airlines recently, a friend of ours arrived in Fort Worth only five and one-half hours after leaving Mexico City—only to spend three hours on the ground in Customs at Cowtown. A lady in the front line had brought dozens of small gifts and each had to be declared separately.

★ ★ ★

TEST PILOT AVAILABLE: One of our readers returned recently from England and the Royal Air Force, via Australia, India and other points down under, with a Distinguished Flying Cross and the India General Service Medal. He had hoped to join the U. S. Naval Air Corps and fight for his native Texas and the rest of the United Nations. But the Navy didn't seem to want him, even if he had logged, in Spitfires, P-40's and other planes, a total of 2,300 hours. He had somehow allowed himself to become afflicted with a touch of malaria during the last eighteen months Down Under, and this was too much for the Navy. Such reception convinced the former International Squadron pilot that civilian aviation was the place for him, so he's getting an instrument rating to go with his Commercial. He's had considerable blind flying on combat missions, including the day he shot down three Jap 97's over Burma. But he needs that CAA instrument rating to make his blind flying ability "official," he says. Then he'll try for a test pilot's job. We'll be glad to furnish his name and address to anyone needing a test pilot.

AMPHIBIOUS GLIDER transport for the Navy, shown taking off from water, has been produced of non-strategic materials by Allied Aviation Corporation, Baltimore, and Winston-Salem. It is believed this one has been stressed for much more speed than the bulky CG-4 type used in Army training.

COBRAS UNAVAILABLE, P-39 pilots at a base guarding the Panama Canal adopted a baby leopard as their mascot. The late Lt. Gen. Frank M. Andrews sent us this shot months ago, but we've been unable to identify the pilot. Can you?

AERIAL TORPEDOES in huge quantities are produced by the American Can Company's Amertorp plant in Illinois. Each of these "tin fish" has 5,000-odd precision parts, weighs over a ton and costs $10,500.

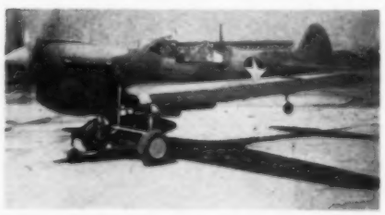
ALTITUDE WIND TUNNEL: The AAF Materiel Command is building a wind tunnel at Wright Field capable of almost incredible performances, designed to test models of high altitude bombers and fighters. Two 20,000-h.p. motors will generate wind velocities of more than 600 m.p.h., and a storage type refrigeration system will reduce the temperature of the blast as low as sixty-seven degrees below zero. Operation at a vacuum of less than one-eighth atmospheric pressure—approximating pressure conditions found at 50,000-ft. altitude—will be one of the brilliant engineering features of the tunnel, which will have a ten-ft. throat.

★ ★ ★

EAGER BEAVERS: Dwane Wallace, president of Cessna, tells us nearly a thousand persons "already are arranging for delivery" of his enticing "Family Car of the Air." This is really something, considering the fact that, to date, the Cessna "Family Car" hasn't been exhibited, or even test-hopped, as far as we know. It has been amply publicized, however, as a plane the "average" person can buy, fly and use to advantage, and Cessna engineers have promised it will be "impossible to stall or spin." To get priority, prospective purchasers list with Cessna the serial number of War Bonds, and as soon as the amount of bonds listed totals $500 or more, a permanent order number is assigned. So far the average initial registration has been $800.

★ ★ ★

CONGRATULATIONS: At its fifth annual convention recently in New York, the Aviation Writers Association elected Wayne Parrish, editor and publisher of American Aviation, as president, succeeding Sloan Taylor, aviation editor of the New York Daily News. Other new officers are Major George E. Haddaway of the Civil Air Patrol and editor of SOUTHERN FLIGHT, first vice president; Phillip Andrews, president of the Phillip Andrews Publishing Company, second vice president; C. B. F. Maculey, editor of Air Tech, treasurer, and Devon Francis of Pan American Airways, secretary.



TRICYCLE P-40 rigged up to familiarize ground crews with taxiing characteristics of the Warhawk. Note rumble seat behind pilot.

AVIATION'S *Mid-American* WAY

—North American Aviation Photo.

Texas has the nation's only plant producing trainers, fighters and heavy bombers. It is North American Aviation's huge Dallas operation, and its products, as paraded in this remarkable photo, are B-24 Liberators, P-51 Mustangs and AT-6 Texans.

By ESTHER H. FORBES

For years the South and Midwest have produced the bulk of Uncle Sam's pilots. Now Mid-America is also turning out warplanes for them — trainers, fighters and bombers. Here's a progress report to bring you up to date.

TO build an air force which will give the United States supremacy of the air, this country has undertaken a gigantic, many-faceted program of production and training. Not only must the aircraft manufacturers produce some 60,000 planes a year; these planes must be built for specific tactical purposes and each must be the best of its type in the world. In addition, the Army and Navy and their civilian contractors must train pilots to fly them, other crew members, ground crew and overhaul mechanics.

During the past three years, a large part of the manufacturing and training expansion has been to the interior, so that today, making a trip through the Midwest and South, you can see almost every type of plane being made and almost every type of training being given.

In Evansville, Indiana, for example, the Republic Aviation Corporation, an East Coast manufacturer, is building the Army's newest and most powerful fighter, the P-47 Thunderbolt. Founded only a year ago in April, the Indiana Division assembled its first Thunderbolt last September and has been rolling the fighters off their assembly lines in a steady stream for several months now.

How the plant was able to get into production so quickly is the story of hundreds of Evansville men and women who set to work in any available room last summer while the plant was under construction. All over the city—in garages, in small machine shops, in unused basements—they were turning out parts to be ready for assembly as soon as the factory was finished. And elsewhere, old-established Midwest companies were making other parts under contract for Republic.

Profiting by the experience and counsel of the parent plant, the Indiana Division was able to design its plant for large-scale production with plenty of room for expansion. Primarily it was planned as an assembly plant, and among its most outstanding features are six mechanized assembly lines, which help to make up what is probably the most complete conveyor system in the country.

Not far to the south, in Nashville, Tennessee, Consolidated Vultee Aircraft Corporation, a West Coast manufacturer, is building another type of plane on another unusual assembly line. The plane is the Army's A-35 Vengeance dive-bomber. The assembly line is the only completely mechanized overhead one in the country.

The purpose of the overhead assembly line is to enable workers to do their jobs without stretching or stooping. Actually it consists of four lines, one each for the forward monocoque, aft monocoque, power plant and final assemblies. Various assemblies are suspended in such a way that they can be moved up or down or turned around their axis in a 360-degree circle, thus making it possible to bring any part within convenient reach of the workers. In fact, through the plant the company has tried as much as possible to have the work all on one level, and as a result the accident rate has gone down markedly.

The record of which the company

(Continued on page 42)

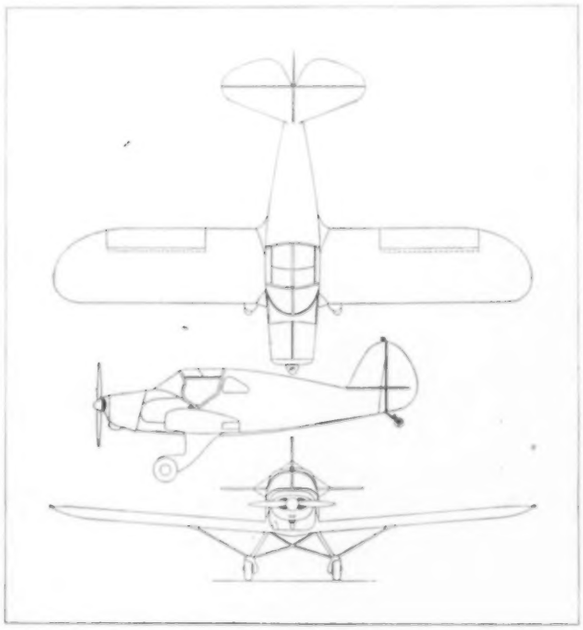
Latest low-wing design for the private flyer is this trim Stearman Ariel, now undergoing final tests at Stearman Aircraft, Inc., Enid, Oklahoma. With an 80-h.p. Franklin it will cruise at 112 m.p.h. and land at 43 m.p.h. Note how wheels protrude from struts.

Stearman Designs a Low-Wing

By TONY HAGMANN

ANOTHER low-wing for the private pilot after the war has made its appearance in the South. It is the Ariel, now being readied for the market by Stearman Aviation, Inc., at Enid, Oklahoma. Gail G. Stearman, vice president, says they have flown the first model approximately 400 miles, and they have about fifty hours on another version. Final CAA approval is pending the outcome of flight tests, but the new plane is already 95 per cent approved, Stearman says.

The Ariel seats two, side by side, and is to be marketed with a choice of three engines, Lycoming 0145 B-2, Continental 75 and Franklin 80. Model "A" (Lycoming) will have a maximum speed of 115 m.p.h., cruising speed of 105 m.p.h. and a forty-m.p.h. landing speed. The figures for Model "B" (Continental) will be 125, 110 and forty-three, and for Model "C" (Franklin) 127, 112 and forty-three.



Wingspan is thirty feet, length twenty feet two and one-half inches, empty weight 618 pounds, gross weight 1,146 pounds.

The fuselage is of the Warren truss type, of welded steel tubing, fabric covered, with a welded steel tube engine mount. Dual stick controls are furnished and there are two doors for the side-by-side cabin, with a baggage compartment aft of the seats.

The low wing, of wooden construction with plywood monocoque leading edge section, is built in two separate panels attached at two points of the fuselage and one point at strut. It is of single spar semi-cantilever construction, with ailerons of full friese type with the two-to-one differential. The airfoil section is NACA 23012. The tail group is of welded steel tubing and channels braced by streamline tie rods above and below the stabilizer and with bungee trim device.

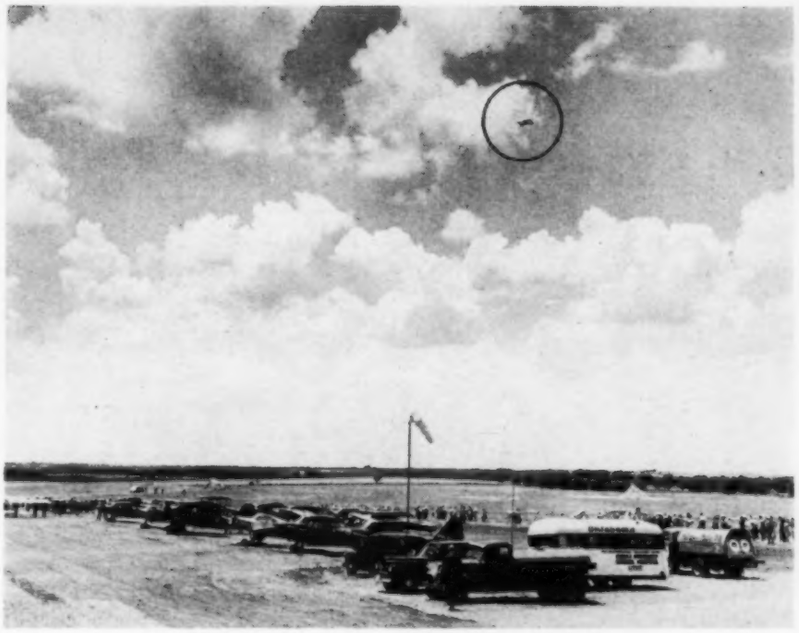
The landing gear is of semi-cantilever shock cord type, with a full swiveling tail wheel unit mounted on spring leaf. Front wheels are equipped with streamlined pants and protrude forward to form an unusual appearance.

Standard equipment includes Freedmond Burnham propeller, Firestone tires, Shinn wheels and mechanical heel brakes, battery, Grimes navigation lights, cabin heater, carburetor heater, wheel pants and fire extinguisher. Instruments include an altimeter by U. S. Gauge Co., a Stewart Warner engine gauge unit, an air speed indicator and a Basco ignition switch.

Full specifications and performance figures are given herewith with the drawing.

	Model A	Model B	Model C
Span	30 ft.	30 ft.	30 ft.
Length	20 ft. 2½ in.	20 ft. 2½ in.	20 ft. 2½ in.
Height	6 ft. 5½ in.	6 ft. 5½ in.	6 ft. 5½ in.
Wing Area	132 sq. ft.	132 sq. ft.	132 sq. ft.
Power Loading	17.63 lbs.	16 lbs.	15 lbs.
Wing Loading	8.68 lbs. per sq. ft.	9.1 lbs. per sq. ft.	9.1 lbs. per sq. ft.
Empty Weight	618 lbs.	680 lbs.	680 lbs.
Pay Load	230 lbs.	230 lbs.	230 lbs.
Useful Loads	528 lbs.	528 lbs.	528 lbs.
Gross Weight	1146 lbs.	1200 lbs.	1200 lbs.
Baggage	60 lbs.	60 lbs.	60 lbs.
Fuel	20 gal.	20 gal.	20 gal.
Oil	1 gal.	1 gal.	1 gal.
Performance			
Maximum Speed	115 m.p.h.	125 m.p.h.	127 m.p.h.
Cruising Speed	105 m.p.h.	110 m.p.h.	112 m.p.h.
Landing Speed	40 m.p.h.	43 m.p.h.	43 m.p.h.
Service Ceiling	14,000 ft.	16,000 ft.	17,000 ft.
Rate of Climb	750 ft. per min.	930 ft. per min.	1050 ft. per min.
Cruising Range	450 miles	430 miles	420 miles
Engine	Lycoming 0145 B-2	Continental 75	Franklin 80

(Editor's Note: Last month, SOUTHERN FLIGHT published an Office of War Information survey of Civil Air Patrol activities in Coastal Patrol against enemy submarines. Here is an OWI follow-up, outlining numerous hitherto unpublished facts and figures concerning inland activities of the CAP.)



—Photo by Oklahoma Wing, CAP.

As this Oklahoma scene during a recent Civil Air Patrol bombing rehearsal shows, private flying is very much alive in America, keyed to the war effort. From such practice drills the CAP draws skilled pilots for its coastal patrol operations, in which putt-putt owners utilize their marksmanship in the war against enemy U-boats.

Private Flying Goes to War

Civil Aviation almost disappeared after Pearl Harbor. But saved from grounding by the Civil Air Patrol, volunteer private pilots now operate over 21,000 miles of courier routes, locate missing military planes, guard forests from incendiarists, save lives and property in flood and storm and contribute otherwise to the war effort.

Civil Air Patrol authorities emphasize the fact that it's the work of the inland squadrons which makes the Coastal Patrol possible. Without the inland squadrons, which have supplied trained personnel from forty-five states, there could have been no civilian sub hunt.

These inland activities — some of them no less dramatic than the ocean work—have developed into a major war contribution, freeing Army pilots and planes for more urgent assignments. The overland flights use thousands of light ships of 90 horsepower or less. Flying low and slow — under 100 mph—the little planes, some of which can operate on less than five gallons of gasoline per hour, are superior to twin- or four-motor craft for short-range, intensive reconnaissance or search. Nothing excels them in this respect except blimps. Skimming over tree tops, threading their way with "local knowledge" through canyons to avoid climbing over mountains, slipping in and out of narrow valleys, landing on pastures, dropping supplies and messages to air-crash survivors, flood victims, lost hunters or marooned fire wardens — all this is work for which private planes are well suited. Once in Nevada when orthodox, high-level aerial search had revealed no clew, they located an Army bomber crash by flying low in the valleys and looking up at the tilted pockets in the mountainsides.

In March, 1942, the control tower at a certain Army air field was reluctant to permit the landing of a small, private plane bearing the unfamiliar CAP emblem of a red three-bladed propeller within a white triangle on a blue disc. The pilot however, kept insisting that he was sent by the Civil Air Patrol with a cargo to deliver. When he had been allowed to land, he surprised the welcoming committee of guards with the size of his load. "We've been using bombers for consignments like that," said an officer.

Since then, the courier service has become well known at almost every field in the country. The light planes use a minimum of rubber on their small landing wheels and burn no more gas than the family auto. They can land where big planes cannot, do short hauls with great economy, and serve as feeders to long-distance airlines. Moreover, the light planes and volunteer pilots are virtually the only untapped transportation resource in the country.

One Pound 100 Miles for 10 Cents

In an experimental thirty-day test of the courier service conducted at Middletown, Pennsylvania, by the Pennsylvania Wing for the Army, five planes flew more than a million pound-miles of Army cargo in the first ten days of the mission, despite bad weather. They flew to points as far away as South Carolina and Georgia, and demonstrated that their rapid transport could carry a pound 100 miles for 10 cents.

In urgent cases, the small planes carry a considerable load. For instance, a plane from the York, Pa., courier station, where there is no commercial airline stop, was sent to Worcester, Mass., to bring back a 300-pound grinding wheel needed immediately in York for war production. The pilot

(Continued on page 36)

—Southern Flight Cartoon by Patton.

The States vs. Aviation

By OSWALD RYAN,
Member, U. S. Civil Aeronautics Board

WE can see but dimly the things to come; but we can see clearly enough to be able to predict a development in air transportation in the postwar period far beyond anything that has gone before.

There are good reasons why this is not a fantastic prophecy. In the first place, the present war has provided a stimulus to aeronautical research and the advancement of the art of flight which has packed into a brief period a technical advance which would have required decades of peace to accomplish. This war has become a gigantic laboratory of experiment and discovery in the field of aviation. The airlines, from necessity, are still using the same types of aircraft which had been in use during the past five years. But those planes are already obsolete; and our domestic and international airlines only wait upon the manufacturing capacity, which will become available at the close of the war, for the modern aircraft that will enable them to carry the air commerce of this nation and a fair share of the air commerce of the world.

Then there will also be available to our air transportation of the postwar future millions of trained aviation personnel who will have graduated from the present war. I am thinking of the pilots, the mechanics, the navigators, the meteorologists and other ground personnel who will be knocking at the door of air transportation when the time comes to convert this American invention from an instrument of destruction and death to an agency of commerce and of peace.

There will be those expanded airport facilities which have been constructed as a part of the war program and which will be available to civil air transportation at the close of this war.

And finally there will be millions of Americans who will have become educated to the unique advantages of air transportation; millions whose vision in the past has been limited to the environment of a two-dimensional world but who are rapidly becoming conscious of the three-dimensional transportation of the air age. This war is opening up the air to the man in the street; and millions of Americans are learning for the first time of the almost unlimited potentialities of aviation.

Now, if we Americans are to keep abreast of the other nations, if we are to preserve our proper place in the forefront of the world's economic and social power, we must be prepared for the air age ahead. We must have an aviation program more comprehensive than we have ever had in the past; we must have a greater vision than we have ever had before.

There is one matter which is of vital concern to the future of air transportation in the Nation. I refer to the question whether air transportation in the future shall develop under the regulatory control of the national government or whether it shall be subjected to a divided control by both the Federal Government and the States. As a lawyer engaged for more than two decades in the field of public utility and transportation law, I was witness to the epoch-making conflict between the Federal Government and the States in the regulation of public utilities and rail transportation. I saw two systems of regulation—one Federal and one State—grow up side by side and I saw the great public service industries that were regulated by them many times burdened by wasteful duplication of regulatory activity and by interminable conflict and litigation over jurisdictional conflicts. I do not want to see such a fate befall air transportation in this country.

What is the sound approach to this question of Federal or State control of air transportation? The approach quite generally has been a legal approach. It has been involved in a controversy over the question whether the Federal Government has the right under the Constitution to exercise the regulatory power or whether the Constitution reserves to the State power over the subject. I confess to you that I view the legal approach to this problem in a frenzy of indifference. This question of air transportation is one of deep concern to the people of this nation and I would rather see the question settled not upon the basis of legalism and controversy over a Constitutional doctrine; I would rather see that question settled on the simple basis of what is best for the people of the State and Nation. If the facts show that air transportation is local in character and can best be regulated by the State or

(Continued on page 46)

The Menace of Renegotiation

--and How to Remedy It

(Editor's Note: Appearing recently before the House Naval Affairs Committee, Vice President Francis Callery of Consolidated Vultee Aircraft Corporation, also representing other aircraft manufacturers, with his remarks, described the Renegotiation Law as a menace to the survival of the industry and outlined steps which Congress should take to correct it. His statement, which follows in full, is also important because it cites facts and figures to show the aviation industry's profits to be much smaller than popularly believed.)

Statement by Mr. Callery: The opportunity to appear before your committee is very much appreciated. I am glad to be able to tell you some of the problems of the aircraft industry and how they are affected by the present war contract renegotiation law.

At the outset, I want to make it clear that the aircraft industry, as a whole and every single member of it that I have any knowledge of, is opposed to making undue profits out of the war. I believe it would be fair to say that we feel as strongly on this point as anyone in the Army and Navy and in Congress. There is a clear distinction, however, between profits and profiteering, and in the course of my testimony I am anxious to explain this distinction.

The aircraft industry has enlisted for the duration. Its business must be judged over this period and the transition period which inevitably will follow. Renegotiation adjusts the yearly profits of the aircraft companies as they appear on their books. These profits in a dollar sense may appear large, but in fact they are mere bookkeeping profits. They are not the kind of profits that stick to your ribs. Stockholders do not get their hands on them. They do not represent undue enrichment to anyone. As far as I know there are no wartime aircraft millionaires in the making.

The profits which the industry has been allowed to retain, and a great deal more in the way of reserves, are needed in order to permit the survival of this great industry which is doing such a magnificent job towards winning the war. Entirely aside from the perfectly natural wishes of all of us to survive, it is obviously a matter of national interest that the aircraft industry should survive and in a healthy condition.

Before coming specifically to the subject of renegotiation, I would like to bring out a few very general facts to support the statement I have made that the stockholders of the aircraft companies have not profited from the war. In fact, they are not as well off now as they were a year or so before Pearl Harbor. I do not contend that they should be better off. I am merely pointing out that they aren't.

I have had some figures made up for six large airframe manufacturers: Boeing, Consolidated Vultee, Douglas, Lockheed, Martin, and North American. In 1939 the average price of the shares of these six companies ranged between $41.70 high and $22.81 low. In 1940 the high was $42.97 and the low $25.72. In 1943, the range so far has been $29.97 high and $21.91 low. The present average price is approximately $24.90. It is clear that stockholders have not made any profit through any increased market value of their shares.

The average dividend of the six companies was $1.06 per share in 1939; $1.96 in 1940; $2.79 in 1941; and down to $1.96 again in 1942. Present dividend payments are no higher than in 1940 and, as stated above, there are no market profits. Dividends and increase in values of stocks are the only two ways I know of by which stockholders can benefit. The aircraft stockholders have not had the advantage of either of these benefits.

I wish to point out, however, that earnings on the average have gone up during this period from $1.83 per share in 1939 to $5.00 in 1940, to $9.61 in 1941, and to $12.18 in 1942. This seems like a fantastic increase. It is, but, as pointed out before, the profits as shown are merely bookkeeping figures. Apparently aircraft company stockholders and investors in general do not consider, and rightfully so, wartime earnings as real earnings — but more in the nature of reserves, and highly inadequate reserves, for the transition period after the war. So much for the figures on the aircraft industry.

Now, if I may, I would like to state briefly a few suggestions as to the changes in the renegotiation law which we think are necessary for the protection of the aircraft industry. We are not asking for rewards. We don't think anyone in industry is entitled to a reward for his contribution to the war effort. We don't want rewards. We ask only that we be left enough in the way of reserves out of the war to continue in business. This, in my opinion, is not asking too much — and I believe this would be voted for by the overwhelming majority of our people.

I have had a great deal of experience with the Price Adjustment Board of the Navy. I have had many meetings with them. I have gotten to know the members of the Board well. Without exception, they are able, experienced, sincere, and patriotic men. In my many meetings they have invariably dealt with me with courtesy and with patience. Naturally, we have had many differences of opinion. We still have, on general policy matters, but we have a mutual respect for the other's point of view.

Speaking of Consolidated Vultee, we have about reached a settlement with the Board for the year 1942. It is the opinion of our directors that it is good busines policy for us to accept the offer of the Price Adjustment Board rather than to continue with further prolonged renegotiations.

The aircraft industry is not opposed to the objective of renegotiation in preventing excessive profits. We think that the law should be amended or the regulations revised wherever possible, or both, as follows:

1. Renegotiation should be based on net profits after taxes; and net profits not exceeding 3 per cent of sales, or whatever rate the Committee might determine, should be exempt from renegotiation.

2. Provision should be made in the Revenue Bill to allow necessary reserves for the postwar transition and these reserves should be exempt from renegotiation. In the aircraft industry, as I hope to be able to convince you, these reserves are desperately needed.

3. The provision for the termination of contracts should be changed so as to give adequate protection to contractors.

With your permission, I would like to comment briefly on the three points

(Continued on page 34)

The War...And You!

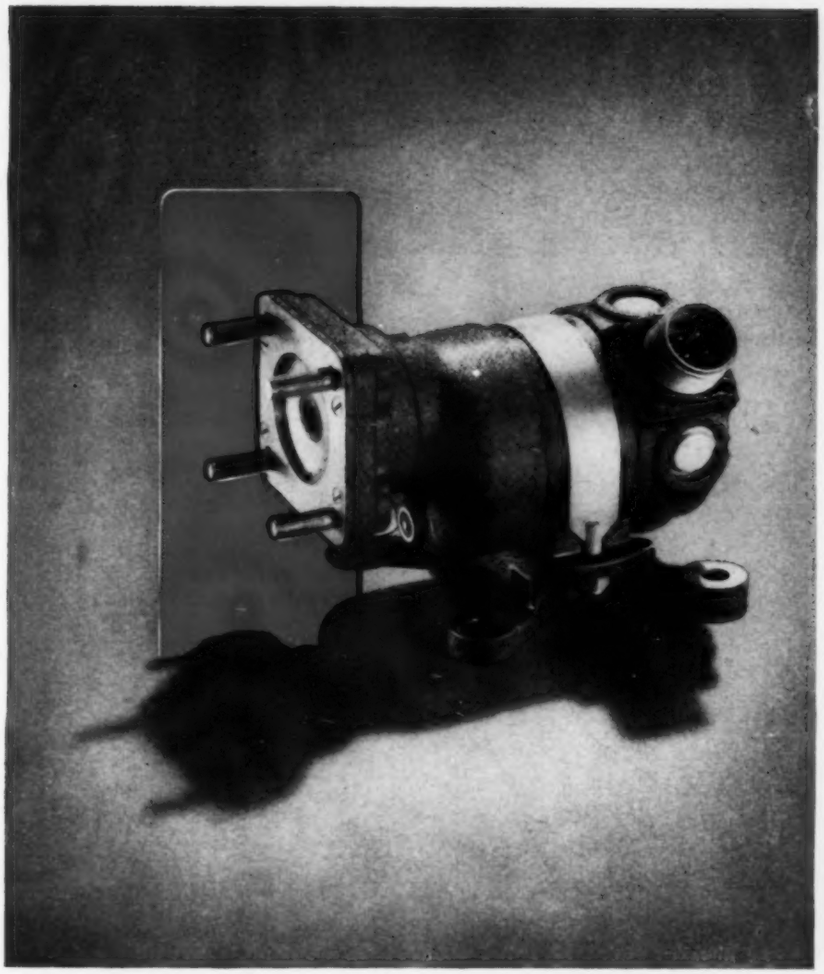
Friend—don't think this war doesn't affect you. It does. It's pushing the world twenty years ahead of time; stimulating the development of devices you may now be making or using. After the war, the average American's life is destined to be fuller, more exciting, more comfortable due to these new products. And just as Weatherhead has helped build the nation's automobiles, airplanes and refrigerators in the past, peace will find us prepared to join you in building these established products as well as the many new ones certain to come out of the war.

Look Ahead with

Weatherhead

THE WEATHERHEAD COMPANY, CLEVELAND, OHIO
Manufacturers of vital parts for the automotive, aviation, refrigeration and other key industries.

Plants: Cleveland, Columbia City, Ind., Los Angeles
Canada—St. Thomas, Ontario



A FULL LINE OF FUEL PUMP DRIVE MOTORS

This new line of fuel pump drive motors reflects our wide experience in the design, development and manufacture of electric motors for aircraft . . . Moderate armature speeds insure longer life for brushes, bearings, gears and commutators . . . standardized design permits unusual interchangeability of all service parts. Three sizes, all built to Air Corps specifications . . . full ball-bearing construction, no sleeve bearings. All light in weight—1/10 hp 4.4 lbs . . . 1/8 hp 5.1 lbs . . . 1/4 hp 5.8 lbs. *Increased production capacity permits deliveries in the last quarter of this year. Specifications and installation data on request* . . . Fuel pump drive motors are but one item in the wide variety of dependable products we engineer, manufacture . . . or supply to the aircraft industry.

AIR ASSOCIATES, INC.

TETERBORO, N. J. . . . *BRANCHES:* CHICAGO, DALLAS, LOS ANGELES . . . ENGINEERS & MANUFACTURERS OF AIRCRAFT SPECIALTIES . . . SUPPLIERS OF ALL TYPES OF MATERIALS TO THE INDUSTRY SINCE 1927

Aircraft Parts from America's New Source of Aluminum

To the aircraft industry, Reynolds means complete Service in Aluminum. Reynolds mines its own bauxite, processes the ore into finished aluminum and then carries the service through to the final vital operation—*fabricated parts for planes.*

Reynolds was the first to produce high grade metal from lean domestic ore and was the first aluminum company to fabricate finished airplane parts.

Now Reynolds is mining more bauxite than was mined in the entire country before the war, converting it into hundreds of millions of pounds of aluminum for aircraft. The Parts Division in Louisville, expanded 40 times, has thousands of workers and batteries of machines on 24-hour schedules.

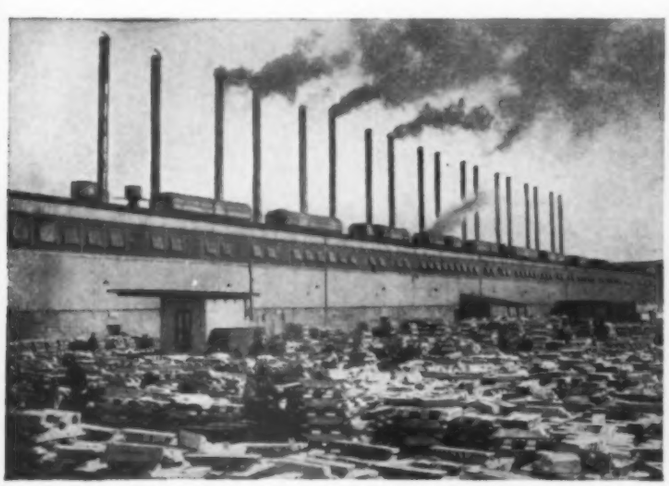
Scrap from fabricating operations (average 30 percent) stays at Reynolds plants, where it is put right back into production. This eliminates scrap headaches for aircraft manufacturers . . . *saves manpower, plant space, freight facilities . . . and keeps inventories down!*

The foresight and courage that created America's New Source of Aluminum has developed the aircraft industry's new source for finished parts. Reynolds Sales Engineers are available throughout the United States.

REYNOLDS METALS COMPANY · PARTS DIVISION · LOUISVILLE · KY.

AMERICA'S NEW SOURCE OF ALUMINUM

INGOT · SHEET · EXTRUSIONS · WIRE · ROD
BAR · FORGINGS · TUBING · FOIL · POWDER



3 Aluminum ingots, outside Alabama plant, are fed into remelt furnaces with alloying metals. Resulting alloys are cast into billets.

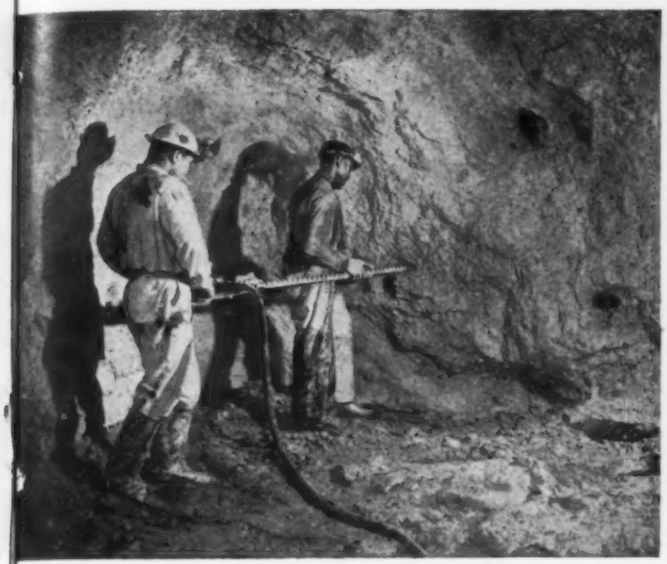
4 Reynolds rolled aluminum alloy forging stock, tested and inspected, ready to be forged into aircraft propellers.

7 Reynolds Parts Division Shearing Line, capacity 4,000,000 lbs. of sheared skins monthly. All skins Navy inspected.

(No Scrap Problems)

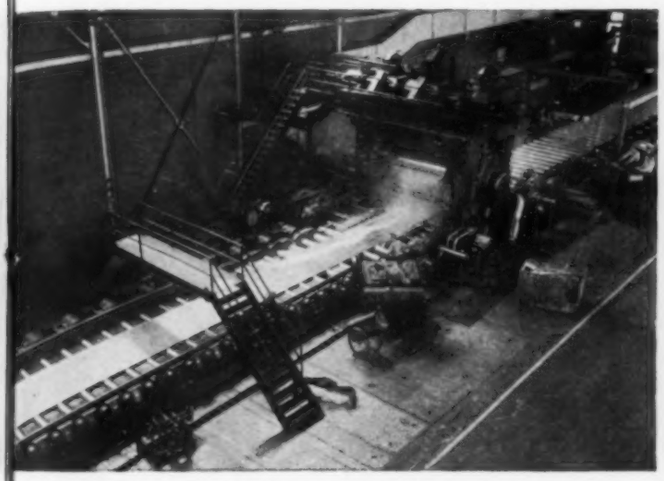
8 Reynolds Router and Stack Drill Department, section of the 250,000 sq. ft. expansion of the Parts Division in Louisville.

(No Scrap Problems)

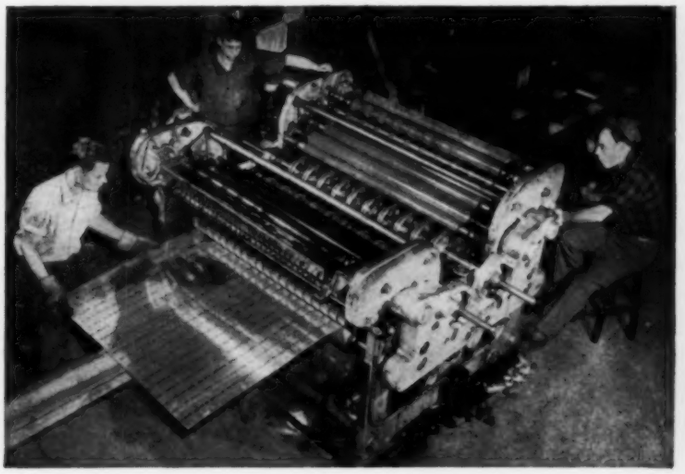


1 Reynolds Aluminum and finished parts start in this Arkansas bauxite mine. Reynolds mines more bauxite than was ever mined in the U. S.

2 Reynolds refines bauxite into alumina; reduces alumina into aluminum; aluminum is cast, alloyed and fabricated into sheet and rod.



5 Reynolds huge "4-high" hot mill, rolls billets under tremendous pressure into long ribbons of gleaming aluminum alloy sheets.



6 First automatic stenciling machine in the Aluminum Industry, developed by Reynolds, permitting closely printed alloy, gauge and temper lines to insure precise identification.

9 Inspection of finished parts — blanked, formed, heat treated, anodized, zinc chromate primed, ready for aircraft assembly lines.
(No Scrap Problems)

RENEGOTIATION MENACE

(Continued from page 29)

I have just mentioned and I will be very glad indeed, after this statement has been completed, to have you ask any questions you might care to ask.

At my early meetings with the Price Adjustment Board a very considerable amount of discussion had to do with whether we should consider profits before or after taxes. I then took the position that profits after taxes were the only real profits. I still take that position. Profits before taxes are stage money. You know the stand of the Price Adjustment Board on this subject and the reasons given, so I will not go into their side of the case.

In a memorandum which I prepared on May 13, 1942, a year ago, just after the law was passed, I pointed out that, in my opinion, the word profit or excessive profit as stated in the law could only mean profit after taxes. Webster defines profit as advantage, benefit, the excess of returns over expenditures in a given transaction or series of transactions. The old adage is true today that there is nothing more inevitable than death and taxes. Taxes are an unavoidable cost no matter how you may reduce expenses by efficient operation of a business. Taxes loom as the one item of cost that is proof against efficiency. It is a fixed element of cost. It is the one irreducible element of cost.

The law says that excessive profits are to be recaptured through renegotiation. The law does not say profits *before* taxes, but the Price Adjustment Boards renegotiate *before* taxes. In my opinion, it makes just as much sense to compute profit before payrolls, or cost of raw materials, as it does to figure profit before taxes. How can a profit be identified as an excessive one until the profit itself is known, and how can a profit be determined until the taxes are known?

The thing that should matter is what the United States Government pays for what it buys. The Government is both the buyer and the collector of taxes. The taxes paid, from an overall cost standpoint, should be considered a net reduction in the price paid by the Government.

To illustrate, let us assume that an identical type of airplane is sold to the Government by each of two manufacturers at a price of $150,000. Let us also assume arbitrarily that this price of $150,000 is after all renegotiation adjustments and the Price Adjustment Board allows each company a profit of 10 per cent before taxes.

Let us further assume that one manufacturer is an aircraft company which designed, developed, and spent its own money on the airplane. This aircraft company naturally has a small tax base (arising from low earnings and even losses in prior years) and its profits are taxed at the 80 per cent overall limitation. The other manufacturer, an automobile company perhaps, would be building the plane to the aircraft company's designs and specifications and would be benefiting by the know-how of the aircraft company. This manufacturer, we will say, has a favorable tax base (arising from high earnings in former years) and is taxed at an overall rate of 50 per cent, as compared with 80 per cent for the aircraft company.

Now, the profit before taxes for each company would be 10 per cent of $150,000 or $15,000. The aircraft company would pay a tax of 80 per cent, leaving 20 per cent, or $3,000, for its net profit. The other manufacturer would pay a tax of 50 per cent of the $15,000 profit, leaving a net profit after taxes of $7,500.

If the price is $150,000 and the profit before taxes $15,000, the manufacturer's cost of the airplane would be $135,000. The net cost to the Government, however, washing out taxes as in one pocket and out the other, would be the manufacturer's cost plus the net profit to the manufacturer after taxes. In the case of the aircraft manufacturer, this would be $135,000 plus $3,000, or $138,000. In the case of the other manufacturer, the cost to the Government would be $135,000 plus $7,500, or $142,500.

In this hypothetical case, which is probably paralleled throughout industry in general, the Government would be paying $4,500 more for the same product from one manufacturer than from the other, and one company would be making $4,500 more profit in wartime for the same service. In effect, this is a subsidy to hold up the earnings during the war of companies that were profitable before the war.

The aircraft companies are selling airplanes which they have created and sweat blood over. It is their only business. They have nothing to look to except airplanes after the war. It is not a stop-gap business for them. Because of low tax bases they end up with less profit than companies which are filling in on war work and will

(Continued on page 47)

★ ABILITY

★ PRECISION

★ PRODUCTION

DOLAN AIRCRAFT MANUFACTURING COMPANY

DALLAS, TEXAS

SUBMARINE BELOW---
FLASHES THE CIVIL AIR PATROL PLANE

The indistinct shadow beneath the water means little to the untrained eye—but, the C. A. P. Pilot and his Observer instantly recognize the outline of a lurking enemy submarine preparing for destruction and death. The Pilot's depth charge is soon on its way—the location radioed to the Army, Navy and Coast Guard. The destruction of the raider is imminent.

Former commercial and pleasure fliers who volunteered their services and their airplanes, the men of the Civil Air Patrol have been risking their lives daily since Pearl Harbor in the grim, relentless search for Axis submarines off our shores. Many ships have been saved from torpedoing—many already-shipwrecked seamen rescued—thanks to their ceaseless patrol. To them belongs no small share of the credit for driving the enemy undersea raiders away from our coasts.

We salute them for the courage, ability and self-sacrifice with which they do their job—and we are proud that many of the planes in which they perform this service to the Nation are Jacobs-powered.

JACOBS AIRCRAFT Engines

POTTSTOWN, PENNSYLVANIA, U. S. A.

PRIVATE FLYING GOES TO WAR

(Continued from page 27)

found the wheel weighed all of 400 pounds, but he loaded it in and brought it back against head winds, thus preventing a work stoppage of several days. Pilots flying courier service under Army orders do not consider their own comfort; sometimes not even their own safety. The only matter left to their own discretion is the decision whether conditions are too bad for flying. In spite of this, they have flown when commercial planes were grounded, in thunderstorms and windstorms that tossed the planes like chips, and taken off from snowy fields where four attempts were required for getting into the air. So far, they have lost three men killed on the inland missions.

Nowadays the CAP Courier service, which is growing all the time, combines a country-wide network of miniature airlines that have printed schedules, and fly as much as 21,000 miles a day.

Down on wild and isolated borders of Texas is another flying service, the CAP Southern Liaison Patrol, which co-operates with both the Mexican and United States governments to keep an eye on border movements. They cover more territory in a day than the horse patrols can investigate in a week, and fly low enough to read the numbers on auto license plates.

Some of the members sign up for three or six months of active duty; others spend one-month vacations on flight missions for the Army. Some fly only on Sundays, train for further service by studying at the CAP classes held two or three times a week at the local high school, lodge hall, or other suitable spot. Each member is required to cover the ground studies necessary for a private pilot's license. The basic CAP course stresses military subjects such as Infantry drill, discipline, first aid, gas protection, military secrecy, and signaling. The advanced course includes air navigation, meteorology, crash procedure, and a number of flying missions simulating actual wartime work.

How They Serve

The units maintain strict military discipline on their own initiative, and at the same time have a semi-military flexibility. Each Wing, Group and Squadron has its own Commander and Staff officers assigned to special duties such as operations, intelligence, communications, transportation and medical work. About a third of the members of a typical unit are pilots, a third

COURIER SERVICE by CAP augments war service by airlines and Army and Navy air transport services. Here's how the Texas Wing advertises its facilities to war industries.

are student pilots, and the rest are either observers or have special ground-crew skills.

Both men and women are eligible for enlistment. Three per cent of United States pilots are women, and CAP figures that some 10 per cent of its membership is feminine. Squadron 421-2, of Atlanta, Georgia, is composed entirely of women, with twenty pilots and a total enrollment of fifty. St. Louis has another feminine squadron, with sixty members. Cleveland's all-girl squadron numbers seventy. A mild controversy whether women's work garb should include slacks, skirts, or culottes did not seriously divide the ranks.

Among the prominent women members are Hollywood's Mary Astor, Nancy Love, who head the WAFS, and Major Ruth Cheney Streeter, in charge of the Women's Reserve of the Marines.

Only American citizens, native-born or naturalized at least ten years, may join. Those naturalized must have come to the United States from friendly countries. Fingerprints of all are checked by the FBI. The uniform is regulation Army, with special CAP insignia, red piping on the cap and red shoulder loops. Officers are appointed as Majors, Captains, and Lieutenants in CAP. The organization is federally organized, and consequently is not hampered in its operations by state boundaries as are State Guard units.

Members on active duty get subsistence pay which has to cover personal expense, cost of uniform, and a good deal of equipment. A moderate rental is paid for plane.

While not on active duty, members serve without compensation, paying for the operation of their own or rented planes. In fact, they carry on so many emergency patrol and practice flights at their own expense that the volunteers are estimated to be spending about a million dollars a month of their own money. A number of states have appropriated money to help their Flying Minutemen, and others have recently been giving them a share of State Guard appropriations. Michigan's State Administrative Board granted $26,000 early in 1943, and the Massachusetts Aeronautical Commission, $10,000. Business and civic groups, impressed by the intiative of their local flyers, have made contributions that total millions. For instance the Middlewestern Exchange Clubs contributed $8,000 for a Link Trainer, the Salt Lake City Kiwanis Club in Utah raised $650 to help pay for a lost-plane search, and so it goes all over the country.

The CAP is, among other things, a huge training organization which has not only advanced the skill of existing airmen, but encouraged many to start flying. The units pride themselves on using what is available in skills as well as materials. If they need a stove, they make one out of an oil drum. They wreck an old barn to build a new hangar, and to light it up they get a power plant from the auto junkyard. A squadron in Texas calls itself "The Wolves" because of the predatory ways of members who scour the country picking up equipment from sympathetic people.

Self-Teaching in Big Way

Following the policy of using whatever is at hand, the squadrons and flights enlist all possible local talent to teach the stiff and varied study courses members are required to pass. The man who runs the radio repair shop, the local valve grinder, lathe expert, photographer, physics professor, and electrician are valuable additions to the pedagogical staff. Soldiers help them learn to drill; ordnance experts give their time; chemists contribute demonstrations of incendiary missiles; commercial pilots explain beacons, radio direction finders, flight theory and the mathematics of navigation. Instructors in a number of squadrons are flyers from the last war, aces from the old Yale Unit and Lafayette Escadrille, men like Capt. Billy Beaver, Executive officer of the Jamestown, N. Y., Squadron, who shot down nineteen enemy planes over the trenches and was decorated by King George V. Some of the veteran pilots, now well trained in instrument flying, are

(Continued on page 38)

Start of a Sky Safari

"Corsairs" take off on AEROLS*

With remarkable smoothness, these Chance Vought fighters, called "Corsairs," race off the flat-top's deck. Enemy ships have been sighted and hunting prospects are good.

Like other American aircraft, "Corsairs" are Aerol-equipped. Thus they can take off and land on a flight deck with speed and safety.

The superb performance of Aerols on today's war planes is but a prelude to the safety and comfort they will contribute to after-the-war aviation.

THE CLEVELAND PNEUMATIC TOOL COMPANY
AIRCRAFT DIVISION • • **CLEVELAND, OHIO**

Also Manufacturers of Cleco pneumatic tools for the aircraft and general industry, Cleco sheetholders, Cle-Air shock absorbers for trucks and buses, and Cleveland rock drills for mining and construction work.

AEROLS*

*THE SHOCK ABSORBING UNITS ON AN AIRPLANE'S LANDING GEAR; THE NAME IS DERIVED FROM THE WORDS "AIR" AND "OIL"—THE FLUIDS USED TO DISSIPATE THE LANDING SHOCKS

ROSCOE ATES, the movie comic who is now in the Army Air Forces, was photographed recently at a Texas CAP coastal patrol base explaining some maneuvers he performed as a pilot during World War I.

PRIVATE FLYING GOES TO WAR

(Continued from page 36)

men who made landings in France by instinct and dead reckoning and on dark fields pocked with shell holes.

Last year, CAP began a cadet branch for a limited number of boys and girls in the last two years of high school. To inaugurate the cadet program, CAP headquarters in Washington printed a one-page application blank, a one-page directive and cadet membership cards, then sent them out. It cost but $200 of Federal money to enroll and train 20,000 cadets.

An observer hunting for a lost plane must know the techniques of area search. Pilots on a disaster mission must be able to drop messages, read panel signals, and decode blinker messages. Squadrons practice such missions extensively. Even such a seemingly minor study as Morse signaling saves lives. A number of times, private citizens with flashlights have been able to blink landing instructions to Army planes in distress, thus bringing them in for a safe landing instead of a crash.

Accomplished by civilian planes for the first time in April, 1942, at Fort Sheridan, the towing of sleeve targets for Army anti-aircraft machine gunners has become a regularly scheduled operation; similarly in the case of tracking, which provides practice for searchlight crews.

Cavalrymen, Cyclists, Divers in CAP

In Nevada, the Air Patrol includes a cavalry squadron of 160 horsemen. Equipped with special saddle-to-saddle stretchers, the riders carry out search missions by following directions from planes. For winter searches in New Hampshire, the unit has a trained corps of ski and snowshoe troopers. "There's hardly a unit of any kind that we can't produce from somewhere," said a CAP officer. "In Akron, Ohio, we've got a motorcycle group. One of our outfits has a diver, and others have crash boats."

As a result of all its practice missions and drills, 16,000 trained men have gone from CAP into the armed services. A typical squadron has more members who have left for flying duties with the Army, Navy, Coast Guard, Marines, Transport Command, the airlines, or the flying schools, than have remained. And the constant turnover continues. In answer to a hurry call from the Ferry Command early in the war, one Wing alone provided fifty trained pilots in three days.

One of the greatest services has been the maintenance of a pool of trained people immediately available for special jobs. CAP Washington headquarters keeps a punch-card system of detailed information on personnel. If a rush inquiry comes in for a man who can pilot a two-motor plane and speak Spanish, who is an expert photographer and a night flyer experienced in flying over coastal areas, the punch-cards go through the sorting machine at the rate of 400 per minute. Out come the dozen or hundred who suit the specifications, and, culled from these, a man can be on his way within the hour.

In July, 1942, alone, at various CAP rendezvous, 303 planes and 785 members assembled in Michigan; in Iowa, ninety-three planes and 260 members got together for a breakfast meeting; in Ohio, fifty-seven planes from five squadrons were reviewed; West Virginia Wing mobilized 100 planes and 200 members for a Sunday meeting; Jamestown, New York, brought together nearly 500 pilots and 230 planes. In the spring of '43, Lansing, Michigan, put on a maneuver at which more than 1,567 uniformed men and women marched in review. They all came at their own expense, and only brought two or three hundred planes because they were saving gas, but their parachute units did a mass jump such as Michigan has seldom seen before or since.

At Sandusky, Ohio, in November, 1942, almost the entire town attended the funeral of Lieut. Lester Ernest Milkey, who had been killed on Coastal patrol when his plane crashed at sea. Over 1,000 CAP members were there, and at the end of the service, fourteen members of the local squadron volunteered to go on active duty under Army orders for the duration, to take the place of the one who had been lost.

Forests and Floods Watched

In May, 1942, a plan was developed in consultation with the U. S. Forest Service and the National Park Service for the CAP planes to fly forest fire patrols. Under the agreement, the agencies assisted were to provide per diem compensation for pilots and observers, and rental for planes engaged in activity-duty forest flight missions. Since then the small planes have scoured millions of miles of timberland in rough mountain country; with lookout towers many miles apart, a fire three valleys away may be out of control before it is visible from the tower, and then there is the problem of getting men and equipment to the spot. But a young man or woman in a Piper Cub, Aeronca, or Taylorcraft can spot such a blaze while it is a one-man affair. Last fall, Ohio rangers, working with CAP patrols, reported that only one fire got big enough so two men couldn't put it out. It was in June, 1942, that Ohio Governor John W. Bricker was himself fingerprinted, photographed and registered for Civil Air Patrol enlistment.

For a long time the amateur flyers of the Far West asked in vain for official permission to patrol Pacific-slope forests of California, Washington and Oregon in the 150-mile-wide

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THE Sky's the Limit

BY BILL GREEN

Sailing rig developed by CAP base for life rafts. . . . It provides mobility to reach safety. . . . Selective service is dangerous drain on essential manpower. . . . How to build a home guard and supply necessary labor, too.

CAP Perfects Raft

THE twenty-five million miles flown by CAP members on coastal patrol along our Atlantic and Gulf Coast seaboard have produced a good many ideas in connection with maintenance of equipment, safety and flying procedure.

The latest idea to bear fruit is the development of a very light, compact sailing rig for use on the collapsible rubber life rafts with which all planes are now equipped.

This rig consists of a sectional mast mounted at the front or bow of the rubber boat and arranged so that it can be hinged either forward or backward to permit, in the first case, the spilling of wind in the event of strong gusts, and also to facilitate righting the boat in the event it is turned over by high waves. It may be hinged backward both for the purpose of making adjustments on the sail and for providing a sunshade in the event of extremely light air and hot sun. The mast is made of anodized aluminum and is, therefore, very light. It is made of short sections hinged together with a locking device so that it can be packed in the same container with the collapsed life raft.

With this equipment, which has been in the process of development on one of the Coastal Patrol Bases for the last three months, members of that base have sailed several hundred miles in the ocean, proving their ability to sail more or less where they want to go and their dependability in all kinds of weather. On one occasion, the boat was sailed in a thirty-five mile wind, which is abnormal.

It is planned to have full instructions for the assembling of the unit printed either on the sail, or in the form of a decal on the side of the life raft.

Various pieces of safety equipment have been provided, such as center boards enabling the boat to be sailed off winds, a steering rudder, and a marine type compass for maintaining the proper course on cloudy days when no other sailing reference is available.

The whole rig is so constructed that it will float and the parts are tied together in such a manner that they cannot become lost from the raft, or each other.

On numerous occasions these rafts have been inflated in the water, the crews have climbed aboard them, rigged up and have actually sailed to land.

While not recommended for actually crossing the ocean, it is nevertheless, believed that this could be done and they will be especially effective as morale builders inasmuch as they will give the crew something to do instead of just sitting there, waiting to be rescued. An investigation of cases where airplane crews have been forced to take to their life raft has shown that in many cases they suffered unduly from lack of water when in fact it was raining nearby, but not where they were. With this new rig at least it will be possible for the crew to sail to the little rain showers, thereby replenishing their water supply.

A complete kit has been provided, containing fishing tackle, food, malted milk tablets, a mirror for signaling, a knife, flares for the Very pistol, etc. In actual practice, it is found that the little boats are not uncomfortable and they are extremely seaworthy. A very small amount of practice has shown that 99 out of 100 men can operate them satisfactorily the first time with a minimum of instructions.

The people who have developed this arrangement are at present writing an illustrated pamphlet which will go with each kit.

★ ★ ★

Our Disappearing Manpower

Lately we have been reading in the newspapers, magazines, and reports that come across our desk, a number of things that should never have happened to these United States of America. People who should know about such things tell us that we have a bigger Army than we need. The Secretary of War is reported to have said that we now have as big an Army as we need unless we suffer unexpected reversals. Nevertheless, the draft continues unabated.

They say that we must have an unrestricted flow of war materials on one hand, and yet on the other hand, they draft the men who are expected to make those materials. Authorities admit we are faced with a growing shortage of food and agricultural products. This, when we are also faced with the necessity of feeding more and more people, especially those in the countries we are now conquering and occupying, is a very serious situation, which may well become acute.

While requiring more and more food products, more and more farmers are being drafted. The draft, however, is not the most serious aspect of the farm product problem. The terrific expansion of defense plants and the high wages paid by most of them, have resulted in an unprecedented demand for labor and a good part of that labor is being drawn from farms. In my home county, it is reported that twenty-six dairymen have already ceased operations due to the fact that they no longer had sufficient labor to take care of the milking and related problems. Some of the herds have been sold to other dairymen, but a good many of them have been sold to the stockyards from whence they go out of milk production completely. At a time when we have the greatest milk requirements in our history, this is indeed a tragedy. Many other dairymen will have to quit business because of scarcity of feed. At the present moment, it is impossible to buy cottonseed meal, which is required as a protein feed for dairy cattle.

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MASSIVE STABILITY

for microscopic precision

A hair-breadth error in calibrating a Drift Meter may well put a long-range bomber many miles off course. Hence the use by Pioneer of a *virtually vibrationless* Calibration Stand, supported by pillars of old "settled" steel. In this massive stand, technicians align the image of the gyro-stabilized reticle with the objective image. Sighting through a series of angular and vertical collimators, they calibrate at successive angles ranging from 15° aft to 85° forward.

The elaborate care exercised in calibrating the Pioneer* Drift Meter typifies the production techniques which, with superior design, underlie the *precision performance* of Pioneer Instruments.

ECLIPSE-PIONEER DIVISION

THE PIONEER DRIFT METER

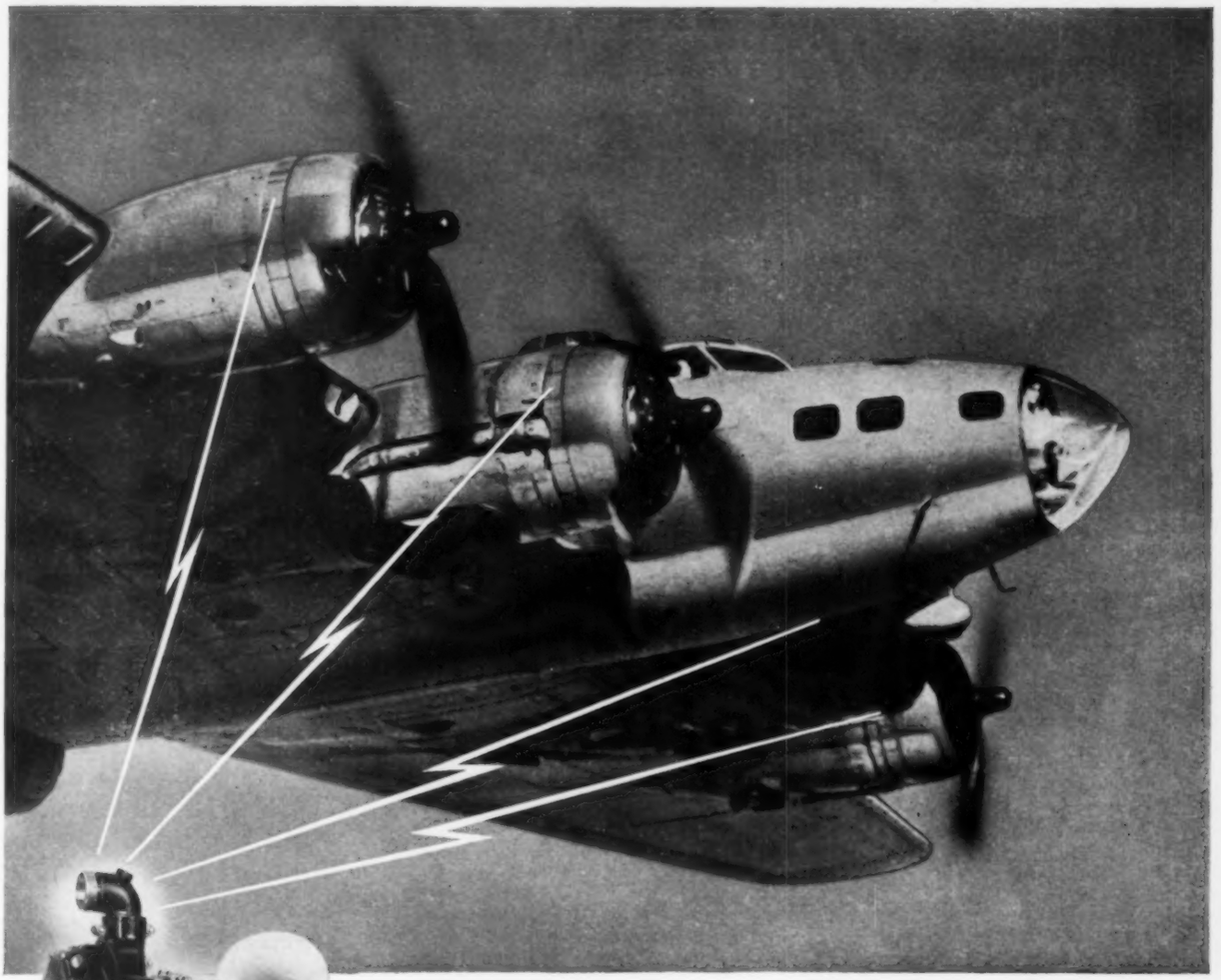
provides a scale reading of the angle between heading and track of plane. It is an important member of "The Invisible Crew" of precision equipment which 25 Bendix plants from coast to coast are speeding to our fighting crews on world battle fronts.

PIONEER INSTRUMENTS

THE INVISIBLE CREW

Precision Equipment by Bendix AVIATION CORPORATION

*TRADE MARK OF BENDIX AVIATION CORPORATION



SPARKS OF LIFE
for the Queen of the Skies

HIGH out of reach of thundering enemy ack-ack, the Boeing Flying Fortress carries out her allotted task. One thing that enables her to fly at such high altitude is Bendix-Scintilla* Aircraft Ignition.

This precision-engineered equipment must generate, control and deliver *every minute* 40,000 sparks to each engine . . . timed to the split second! That calls for *precision* ignition . . . as engineered by Scintilla.

Engineering Bendix-Scintilla Aircraft Magnetos, Harnesses and Switches to their present high-altitude performance has constituted a series of major accomplishments in aircraft ignition design.

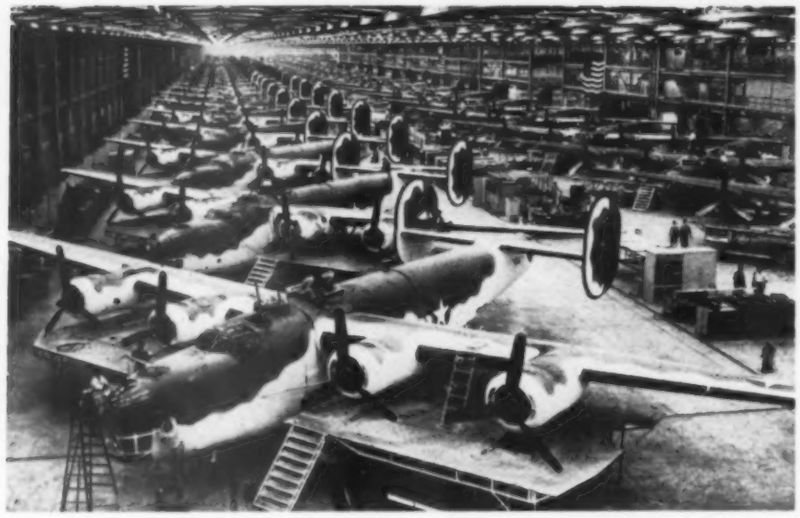
Today, these accomplishments are contributing importantly to the strength of wartime Air Power. Tomorrow, they will just as surely aid the progress of peacetime Air Transportation.

Bendix-Scintilla Aircraft Magnetos, Harnesses and Switches are vital members of "The Invisible Crew"—precision equipment which 25 Bendix plants from coast to coast are speeding to our fighting crews everywhere.

THE INVISIBLE CREW
Precision Equipment by
Bendix
AVIATION CORPORATION

*Trade Mark of Bendix Aviation Corporation.

SCINTILLA MAGNETO DIVISION BENDIX SCINTILLA THE WORLD'S FINEST AIRCRAFT IGNITION



—Consolidated Vultee Photo.

LARGEST BOMBER FACTORY IN WORLD is at Fort Worth, Texas. Here's the double assembly line in the mammoth Consolidated Vultee plant at Fort Worth, with B-24 Liberators on the left and C-87 Expresses on the right. The lines stretch one mile into the background.

AVIATION'S MID-AMERICAN WAY

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is proudest, however, is the absentee rate—being, as it is, the lowest in the country for aircraft plants. During a survey made a few months ago the Nashville *Tennessean* found that over a six weeks' period only 2.6 percent of the employes were absent, as compared with the 6 to 30 percent in the defense factories surveyed by the *Wall Street Journal*.

Upon entering the plant, you can soon see one tangible reason for this remarkable record. On the time card boards, sprinkled in with the regular blue cards, are a few—but only a few—red cards, which have been substituted for everyone who is absent. When the absentees return to work, they must present these cards, together with an explanation for their absence, to the personnel department.

Since the Vengeance is a highly specialized airplane, its construction includes certain peculiar parts which immediately catch your eye. The most obvious, of course, are the dive brakes. Those on the Vengeance are so devised that they rise hydraulically into an open position in the center of the wing between the leading edge and the trailing edge, the top side opening forward and the bottom back. Because of the greater stability and control with brakes in this position, rather than on the trailing edge of the wing as in other dive bombers, they are now being used on the Mustang as well.

In a new building near the plant, Consolidated Vultee is performing another service for the Army Air Forces—training AAF mechanics to service the Vengeances. The company provides the instructors, all the necessary maintenance equipment and two complete planes, so that three groups of eighty men each are always under instruction, learning to reassemble, service and maintain the bombers wherever they are needed.

Big Texas Plants Humming

Going west into the heart of Texas, you find within about thirty-five miles of each other two of the country's largest aircraft factories, both of which have been built since 1940. One is North American Aviation's plant in Dallas, which is building Texan trainers, Mustang fighters and, in a large new addition which about doubles the former floor space, Liberator bombers. The other is Consolidated Vultee's famous Fort Worth plant which is turning out Liberators and Liberator Express cargo planes on the longest mechanized assembly line in the world.

Probably the most outstanding characteristic of the North American plant is its versatility. Originally the Dallas division was designed to build only the Texan, which both the Army and the Navy had adopted as their standard single-engine advanced trainer, designating it AT-6 and SNJ-4, respectively, and which the British had ordered in quantity as the Harvard. By the beginning of 1942, the Dallas plant had taken over the entire production of the advanced trainers; by March, 1943, it had turned out its first Liberator; and by now it is well into production on the Mustangs.

The plant is versatile, too, in the scope of its operations, for it is a complete manufacturing unit. All along the back of the plant are unloading "docks", where the raw materials come in. From there you can follow their progress from beginning to end, as they take shape as small parts, as they join other parts in subassemblies and, finally, as they take their place in the finished plane. Only such specialized equipment as the engines, propellers and landing gear are obtained from other companies.

Not only can North American manufacture all its own parts; it even has its own foundry for making the dies. Unlike most foundries, this one is clean and quiet. Most of the dies are made of plaster. For this work in plaster, North American employs a number of professional sculptors of such calibre as Octavio Medellin, whose works have been exhibited in the Museum of Modern Art in New York. As new dies are needed or as old ones become obsolete or at all imperfect, the foundry quickly goes to work on the order and within a few days the new ones are in place in the factory stamping out parts. Just as decentralization was best for Republic's Evansville Division, so complete manufacturing facilities have been brought to a high degree of efficiency by North American.

Awesome is the word for Consolidated Vultee's mammoth Fort Worth bomber factory. It is so long that it is almost impossible to see from one end of it to the other, and it is so high that there is plenty of room for two mezzanine floors in the assembly building. Indeed, its size tends to dwarf the size of the huge four-engine bombers, and from the second mezzanine the planes look almost like miniatures as they come down the assembly line. Yet the planes are actually so big that people are being employed to work inside the wings.

In order to begin to see the various steps in the building of a Liberator, it is necessary to drive through the plant in a power-driven scooter. Going first into the parts plant, you find a regular railroad depot right in the factory, unloading raw stock, forgings and subcontracted parts into full-size trucks. The parts plant extends three-quarters of the length of the assembly building and is the manufacturing unit for all the 305,000 parts, plus almost a million nuts, bolts, screws, washers and rivets which make a Liberator. For moving the larger of these parts and the heavy subassemblies, twenty-two overhead cabs are in constant use throughout the plant.

To make the work on the final assembly lines comparatively simple and quick, as many subassemblies as possible are made before reaching the line. In fact, division of labor is the keynote of production at Fort Worth and is carried to its limit, each job being broken down into its smallest components. As a result, of course, a staggering amount of floor space is devoted to subassemblies. Not only are there hundreds of different subassemblies, but at each station there are scores of subassemblies in various stages of completion.

Arizona Does Modification

By the time the three major subassemblies are united, there is little left to do to the plane except to make the wiring and tubing connections. Incidentally, although there are only two assembly lines, there are three mating jigs, so that before one plane reaches the final assembly line, the next one is beginning to take shape.

As the planes reach the end of the line, the tremendous doors at the end of the plant are opened and a tractor pulls them outside, where all the most secret jobs are done. These jobs are part of the work which is usually done at modification centers, but the Fort Worth plant does its own modifying, including camouflaging, weatherizing, making last-minute changes, and installing secret equipment such as the bombsight.

Out in Tucson, Arizona, Consolidated Vultee has another plant purely for modification, to take care of the B-24's from the main plant in San Diego. Lying out in the Arizona desert, the plant is probably unique in that over half of the work on the assembly lines is done outside. Of the three lines now in use, two start outside the original hangars, run inside for part of the work and finish outside again while the third operates entirely under the open sky. This is possible because of the climate in Tucson, where rain is almost unheard of. The only weather problem is the summer heat, and, since most of the modification work is done inside the planes, that has been overcome by individually air-conditioning them.

Within the hangars is the parts department, where all the parts which are needed for last-minute changes in the planes are custom-made until the changes can be incorporated into the San Diego production line. Because the work in a modification center is so dynamic, quantity production methods cannot be used. Skill and ingenuity thus assume tremendous proportions, and a few machines must be made to go a long way. In Tucson, for instance, stock has often been cut with tin snips, hand formed over maple blocks and the pieces burred with disk-type knife sharpeners from the ten-cent store. One 60-ton hydraulic press, bought from an automotive concern which used it for pressing gears, has stamped out a large variety of rush orders with dies made of hard wood and with one accepted part as a pattern.

—Cessna Aircraft Photo.

KANSAS BUILDS MORE TRAINERS than all other states combined, producing thousands of Boeing's Kaydets, Beech's several twin-engined types and Cessna's twin-engined Bobcats and Cranes. Here's an historic Kansas picture of the year 1941, showing President Dwane Wallace (tall one with dark hair, center) delivering his 100th trainer to Canadian officials. Hundreds more have been produced since then.

Kansas Has Big Industry

Returning to the Midwest, you find clustered together in Wichita, Kansas, three aircraft companies which between them are producing the bulk of all the country's trainers—primary and advanced trainers for pilots, and other advanced trainers for navigators, bombardiers and gunners. These companies are Boeing Airplane, Cessna Aircraft and Beech Aircraft.

In its plant 1, Boeing is concentrating on the Kaydet primary ship, known to the Army as the PT-17, to the Navy as the N2S-3, and to thousands of Air Force pilots as the plane in which they received their first flight instruction. For over a year now the Kaydets have been coming off the assembly line at the rate of one every ninety minutes, and on April 21, the 7,000th was delivered to the armed forces.

One of the first things you notice in the plant is the large proportion of women at work—47 percent according to statistics. Because the parts of a trainer are in general lighter and smaller than those of a combat plane, a trainer plane has more jobs which a woman can do, and all three Wichita companies are employing a large number of girls. Boeing's percentage, however, is the highest—and not only for Wichita but for the whole industry.

Like North American, Boeing makes its own parts both for the steel fuselage and for the plywood wings, and women are being employed for almost every kind of job. In metal work, they machine, rivet, weld and help assemble the fuselage into what looks like a set of acrobatic bars. In woodworking, they have turned to with hammer and nails—and, incidentally, what they find hardest to learn is not how to do the work but to speed it up by "spitting" the nails. In fabric work, women comprise the whole rib-lacing department with even the foreman a woman.

Cessna, too, has its share of records. One of the few Midwest companies to do its own designing, it was first to develop a twin-engine bomber-pilot advanced trainer, and it has produced more of this type of plane than all the other manufacturers combined. The

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PRIVATE FLYING GOES TO WAR

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restricted band. They said they were the only ones with the men, planes, and ground crews to do the job the way it needed doing. Recently a limited number of pilots were permitted to fly these patrols. But the other aviationists still carry on actively. In Sacramento, California, for instance, Group 919 has 400 men drilling regularly, though they have been grounded since the war began.

Ohio Squadron 518-2 has a member who bicycles eighteen miles to meetings. Starting home on a rainy evening he dons his slicker and pedals away shouting, "See you tomorrow night, fellows."

The planes see action in floods as well as in fires. During an April flood along the Missouri River, the worst since 1881, the Iowa Wing, mobilized by order of the Governor, put itself under the orders of the State Guard and kept men and planes on duty for a week. Reconnaissance missions were flown, and the whole ground force was on duty. With the flood receding and all dikes holding, the CAP was ordered home for a rest. But within an hour the river started rising again. One hundred and twenty members were reassembled and divided into details for filling sandbags, guarding dikes and building levees. Along with OCD volunteers and State Guards, fighting the river all night long and most of the next day, they held the dikes around the city pumphouse and averted a disaster.

Scores of times the little planes have pancaked down onto soggy fields to bring doctors, nurses, food, plasma or serum to communities cut off by rising waters, and at Point Pleasant, West Virginia, they carried in food and a chef to feed the workers of a marooned ordnance plant, landing on a "runway" marked out with rice across the center of the parking lot.

By arrangement with three states, the volunteers get their expenses paid for patrolling 1,000 miles of levees along the lower Mississippi. On the principle that a stitch in time saves nine they report small leaks which a man with a wheelbarrow can fill in fifteen minutes. A few hours later, 300 men and four steamshovels might be able to do it, and then again they might not.

WANTED: One BEECHCRAFT with Wright seven-cylinder engine and complete equipment. Ship and engine must be in excellent condition and never cracked up. Complete engine and ship logs required. Write H. Booker, Aircraft Woodwork Mfrs. Inc., Hutchinson, Kansas, giving complete details and lowest cash price in first letter.

AVIATION'S MID-AMERICAN WAY

(Continued from page 43)

present models are the Army's AT-17 Bobcat and the RCAF's Crane, both low-wing monoplanes made with a welded steel tubing fuselage and plywood wings.

Recently Cessna has developed another new type of plane—a highly maneuverable twin-engine utility cargo plane called the UC-78 Loadmaster, which can land on small front-line fields inaccessible to the larger transports. Having passed its Army tests, the prototype of the Loadmaster is now at Wichita, where the last bugs are being ironed out while the company is tooling up for a large production order.

At Beech you find a twin-engine advanced trainer for every member of a bomber crew. The Beech AT-7 gives navigators a chance to practice in the air the theories which they have been learning on the ground. The AT-10 Wichita (a bomber-pilot trainer, like the Bobcat) gives pilots and co-pilots their first multi-engine instruction. And the AT-11 Kansas gives pilots, bombardiers and gunners their first taste of the teamwork which is so essential to successful bombing missions. In addition, Beech is building a cargo version of the well-known Beechcraft single-engine 4-place biplane as a personnel transport for the Army.

Long a center of aeronautical acticity, Wichita had a total of twenty-nine aircraft companies in 1929—though, of course, many were making only one plane in an old machine shop or garage. Today the number of companies has decreased to three, but the employes have so increased that four tremendous housing projects have been started under the FHA to take care of them all. The newest of these developments, Plainview, is one of the largest undertakings of its type in the country. Designed to house 25,000 people, it covers one square mile near the Boeing plant and will eventually have six grammar schools and a high school.

The last step is Kansas City, Missouri, general headquarters of TWA, where you find TWA engaged in a variety of "extra-curricular" activities for the Army Air Forces. For the Air Transport Command, TWA pilots are flying cargo planes on regular daily routes and TWA mechanics are maintaining and overhauling the planes; for the Technical Training Command TWA mechanics are training enlisted men to become hydraulic, electrical, instrument, propeller, engine and aircraft maintenance men, and radio mechanics and operators; for the Air Transport Command TWA personnel are also operating a Flight Training Division to train pilots, navigators, control officers, flight radio operators and radio mechanics; and for the Material Command, TWA mechanics are modifying B-25 Mitchell bombers from North American's nearby plant.

At first you are rather surprised to discover an airline undertaking such various activities, but as you see each in operation you begin to realize that the airlines, through their years of experience, are exceptionally well qualified to perform these services. Because of the airlines' high standards they have always gathered into their fold many of the best pilots and mechanics in the country. It is only natural that these first-rate specialists should be sought by the Army to fly cargo routes themselves and to instill their knowledge and standards into future Army cargo pilots and ground crews.

Operating modification centers comes naturally to the airlines, too. The purpose of the centers is to provide a place where changes can be made on the planes without slowing down the production line, and this is exactly the kind of individual work that is the maintenance men's specialty. In TWA's modification center, the maintenance methods of the airlines are being used rather than the more familiar assembly line methods of the aircraft manufacturers. Two lines of five B-25's each are brought into the hangar at once, and then each plane remains in one spot during the entire modification. Instead of the planes moving from station to station, the workers move from plane to plane, each man doing his particular job. Soon, when enough people have been trained, a crew of twelve will be assigned to each plane and even the workers will not have to change stations.

Designing trainers, fighters, bombers, transports; building them; modifying them; maintaining and overhauling them; training ground crews; training pilots, bombardiers, navigators, gunners; training flight crews and squadrons—these are the jobs which must be done to build a mighty air force. And everywhere you find private aircraft companies and airlines, as well as the Army, expanding their operations to get these jobs done.

SKY'S THE LIMIT

(Continued from page 38)

We suspect that the administration has been deluded into believing that all it has to do is order something and it will be produced.

In the case of the airplane business, the president ordered in one year about ten times as many airplanes as has been produced by all the factories in the United States since aviation began. It is miraculous that he got those airplanes, but he did so because of the fact that the demands upon the rest of industry had not yet assumed the gigantic proportions required later and the drain of manpower had not reached its ultimate.

However, when he later made demands upon the farmers of this country to produce more farm products, he expected them to do so with less machinery and fewer employes than ever before. No other industry has been able to produce much more goods with a lot fewer employes and no new machinery.

This brings up then a problem we have mentioned before in these columns — that is, we believe the United States has taken on a great deal more than its fair and equitable share of this war business. We cannot be expected nor is it just, to produce most of the goods, most of the ships, and furnish most of the soldiers, too.

Looking back at the last war, we see that a great many of the soldiers in our armed forces — in fact, approximately 50 per cent — never did see active duty across the ocean. We suspect that the same ratio will hold true this time. We suspect that the demand for an Army of the size we now have, and the size we contemplate ultimately, was based on hysteria. We certainly never intended to get all of them across the ocean and into foreign service, as to do so would result in lack of defense of this hemisphere. Some people have said that defense began 5,000 miles from home, but the lifeline must be right around your yard fence.

★ ★ ★

A Suggestion

We humbly suggest for the consideration of those who control such things, the following ideas:

(1) A good many years ago, we enlisted as a buck private in the 179th Infantry, Oklahoma National Guards. That was in the 45th Division which now spearheads the drive in Sicily. We discovered that in drilling one night a week, about two hours and a half, fifty-two weeks a year, and with a full-time two weeks' summer camp, that we were able to be made into pretty good soldiers, with a bare knowledge of our arms, military courtesy and discipline, special knowledge of one sort of another that was required, etc. We know that at the beginning of this war, the 45th Division, which was composed largely of soda jerkers, store clerks, young lawyers, draftsmen, engineers, toolboys, and what have you, was simply activated and put to work. We have seen now that that 45th Division has been able to carry its part. Even trained, professional soldiers are no good until they have had their baptism of fire.

(2) The Civil Air Patrol has shown that it is possible to recruit many thousands of part-time soldiers, willing to give their time, buy their own uniforms, submit to rigid discipline, work, study and learn and to do yeoman service when permitted. We know that the Civil Air Patrol rejected thousands of persons because they did not fit into the requirements which consisted of a primary interest and some training in aviation. We suspect that if the Civil Air Patrol were expanded to be a civil auxiliary army, that it could enroll several million volunteers. All you have to do to believe that statement is to look around and see how many people have volunteered as air raid wardens, spotters, civilian defense workers, etc. It is a magnificent army.

(3) We wish then to advance these ideas as a solution to many of the problems with which we are now and will be faced in future generations:

(a) That an auxiliary army be created, preferably under the command of those leaders who have established the Civil Air Patrol and have gained that experience.

(b) That this army be composed of able-bodied citizens within the United States of America, who are not actively serving in the armed forces.

(c) That this army be required to meet one day each week in its own locality where it would be trained under regular army personnel designated for the purpose.

(d) That the government supply such equipment as necessary which would be a permanent part of the program, remaining there and sufficient for any emergency.

(e) This group would be divided into all the present branches of the Army and organized accordingly. It would continue in peace or in war. It would be the defense agency for the country at home. In wartime such units as were actually required for the conduct of the war would be activated and the others would remain at home in industry and undisturbed except for their one day per week training.

(f) This one day per week might or might not be paid for. One day's service is no worse than an equivalent tax.

As we see it, this plan would work about like this: The United States would have a bigger trained Army than it has at the present time. However, this army would train only one day per week unless required by emergencies to go on full-time basis. The other six days per week this army would be in civilian industry. This would eliminate the terrific expense of maintaining huge army camps where a great many people are simply stall-fed for the duration of the war and all industry is disrupted thereby and therefor.

Inasmuch as these people would be kept at home it would eliminate a great deal of the useless travel on railroads, airlines, and other agencies, would give a little more room in hotels for those who must conduct vital war business, and would lower the drain on the country's resources.

This scheme has already been tried in its various phases, but never as a national policy. Various polls have shown that the people are ready for universal compulsory military training.

Take it or leave it, this idea would produce the greatest nation in the world as far as defensive ability is concerned, and at the same time would maintain its civilian economy which is, after all, the strength of any nation. We believe that some variation of this plan is the solution to most of our defensive and military problems. After all, our huge standing army at home is only a reservoir for the armed forces abroad, and such a reservoir could be provided for the next war by starting now.

In addition to that, there are plenty of trained soldiers at home camps *now* who could be returned to industry, farms, etc., and put on a one-day-a-week training basis so that, in effect, they would be kept prepared. This would enhance the farmer's ability to produce more milk, cereal and other farm products, and would permit industry to breathe a little easier. It would require a much less drastic adjustment when the war is over, as there would only be about one-third as many people to be absorbed at that time by our local economy.

We suggest that some consideration be given this, or some plan to solve these problems, and quickly, before it is too late.

STATES vs. AVIATION

(Continued from page 28)

by the State and the Federal Government together, then by all means let us have it that way. If, on the other hand, air transportation is found to be inherently national and not local in character, and if its local phases cannot be separated from its interstate operations, then both wisdom and law call for a unified regulation by national action. I do not know of any sounder approach to this question of Federal or State jurisdiction than that which was expressed by one of the great Justices of this Nation in handing down the opinion of the high court in a celebrated case. It was the so-called migratory bird case in which the State of Missouri challenged an Act of Congress in the Supreme Court of the United States as an unconstitutional interference with the rights of the States as they are reserved by the Tenth Amendment. The Tenth Amendment, you will recall, declares that those powers not delegated to the United States by the Constitution nor prohibited by it to the States are reserved to the respective States. Missouri contended that that Amendment reserved the regulatory power to the State, and Justice Holmes in his opinion said: "We must consider what this country has become in deciding what that Amendment has reserved."

Now if we consider what this country has become in the field of aviation in deciding the question of State regulation of air transportation, we shall be able to reach a sound conclusion as to the best governmental policy. We shall find that from its very beginning air transportation has been national rather than local in character. By reason of its great speed and mobility and the fact that it was not limited by mountain barriers or the barriers of oceans, the airplane was never limited to a local operation. There are probably not more than five States in the Union today which cannot be traversed in a couple of hours flying time. The average passenger trip by air is nearly 400 miles in length, while the average passenger trip by rail is less than fifty miles. Thus air transportation is a long distance transportation. That is one reason why there is not today a single certificated airline whose operations are confined to a single State.

So you see air transportation by its very nature is national in character and it will be more so in the postwar period which is ahead of us. As I have already said, the technical progress made during this war has made it possible to produce planes which in speed and performance will exceed anything that has gone before.

I submit that air transportation is a national problem and requires a single unified national regulation. And I predict that if this new transportation is to be subjected to the varying regulations of forty-nine different governments, we shall not be able to achieve that air transport development in the future which this war has proved to be so essential to our national security. For the economic burdens which might be reasonably expected from such multiple regulation would be so great as to effectively prevent the essential progress of this important public service industry.

The economic burden of multiple regulation is not the only potential barrier to the development of air transportation in the postwar future. There are other barriers equally, if not more, obstructive to sound development such as economic barriers that can flow from the unwise exercise of the State taxing power. I do not say that these evils are certain to beset American air transportation in the future. I do affirm that they lie within the range of possibility, that they have appeared at times in the past and that we should be on guard against their recurrence in the future.

Let me mention an example of multiple taxation which has recently appeared in the State of Minnesota. The County of Ramsey imposed a tangible property tax on the entire fleet of planes operated by Northwest Airlines in its service from the Pacific northwest to the City of Chicago. This tax was laid notwithstanding the fact that Northwest Airlines' planes were constantly moving from one State to another, notwithstanding the fact that only a part of the company's air fleet was ever in the State of Minnesota at one time and notwithstanding the fact that Northwest Airlines had paid a proportionate tax on the same planes in all the other States through which the company operates. In spite of these facts, the Supreme Court of Minnesota upheld the power of the county to impose the tax in question.

Now there can be no question of the right of Minnesota to lay an equitable tax upon Northwest Airlines. But the Minnesota County in this instance laid a full tax upon the entire airline fleet, a part of which had likewise been taxed in five other States. It requires no great imagination to foresee what would happen to air transportation if economic barriers of this kind are to be set up through the State taxing power. I think you will agree with me that there is pressing need for a solution of this problem by whatever appropriate remedy exists to safeguard the future of an industry which, by the red light of the present war, is revealed as vitally essential to our national security.

All this calls to mind the historic fact that it was the determination of our forefathers to destroy economic barriers between the thirteen original States which became one of the principal causes for the establishment of our Federal Constitution. It was the desire of these early Americans to strike the shackles from trade and commerce among the States that led to the formation of a more perfect Union. You will remember that Congress under the old Confederation which preceded the Constitution had no power to prevent the individual States from levying duties or even prohibiting the export or importation of goods. As a result of the economic barriers that were imposed, business practically came to a standstill and it became necessary to free interstate trade and commerce from those economic burdens.

That objective was accomplished by writing into the new Constitution what we know today as the "commerce clause." Under that clause the States surrendered to the Federal Government the power to regulate commerce among the States; that action meant that in the future no State could place economic barriers athwart the path of the Nation's progress. No other weakness of the Confederation contributed so much to its downfall as did its lack of power to regulate and control commerce among the States; and no part of the new Constitution contributed more to the establishment of the new nation upon a sound economic basis than did the commerce clause. But old evils long since vanished sometimes reappear in new form, and I think the ghost of one of those evils appears today in the tendency to rear barriers to trade and commerce among the States.

Let me say in closing that while we, of the Civil Aeronautics Board, are conscious of the solemn responsibility that has been committed to us to foster, encourage and regulate the development of our national and international aviation, we approach the task of the postwar future with cheerful optimism. That optimism is born of the record of creative achievement that has been written by the men and women of American aviation in the past. I am thinking of the manufacturers, the engineers, the scientific men, the pilots and the operators who have blazed aviation's trail to the present hour.

RENEGOTIATION MENACE

(Continued from page 34)

have huge market demands for their own products after the war.

I imagine that a number of examples have been brought out before your Committee on how net profits are affected by varying tax bases. The extreme example under present tax rates would be a comparison between two companies, one with the highest tax base and the other with the lowest base, assuming both companies are allowed a profit by the renegotiators of 10 per cent before taxes on adjusted sales. The company with the high base would pay a tax of 40 per cent, leaving him a net profit of 6 per cent after taxes. The other manufacturer with the low tax base—and the aircraft industry generally is in this class—would pay a tax of 80 per cent, leaving him a profit of 2 per cent after taxes.

In this illustration, it is 6 per cent net after taxes compared with 2 per cent net. The old company with a good background of earnings and probably large capital reserves makes three times as much net profits as a manufacturer with a small tax base. In nine cases out of ten the low profit company needs the additional profit much more urgently than the high profit company.

I have heard it said that the job of renegotiating the thousands of war contracts would be materially reduced by exempting companies doing an annual renegotiable business of $500,000 or less. This, I understand, would screen out a large number of contractors, some making very high profits perhaps, and others small profits.

We think a fairer method of screening would be to exempt companies on the basis of profits made, rather than on the basis of the size of their business. The suggestion made earlier that profits of 3 per cent or under after taxes, or some other appropriate rate, be exempted from renegotiation would, in our opinion, be an effective method of screening. Under this method, the companies exempted would not be making, by and large, inordinate profits out of the war.

I do not by any means wish to convey the idea that companies are entitled to 3 per cent after taxes and that this profit rate must be allowed by the procurement agency. I think it is the job of the procurement officers to buy as cheaply as they can. But if, through efficient operation, a company can end up with a profit of, say, 3 per cent after taxes, this profit should be his and not subject to recapture through renegotiation.

It has been said that the computation of profits after taxes is highly inflationary and requires a high price in order to allow a company to end up with such-and-such a profit after taxes. I do not agree with this contention at all. If the Government agencies, the Treasury and the procurement authorities, are considered on an over-all basis, it amounts to merely a matter of "in one pocket and out of the other."

This we think is the most important single problem confronting the aircraft industry. The problems of the industry can be well illustrated by using the figures of Consolidated Aircraft with which I am familiar.

Our business has expanded from sales of $3,600,000 in 1939, $9,300,000 in 1940, $94,800,000 in eleven months of 1941 and $304,000,000 for the year to November 30, 1942. The sales of Consolidated Vultee Aircraft Corporation for the year to November 30, 1943, are estimated at over $650,000,000. This company represents the merger of Consolidated and Vultee which became effective on March 18, 1943. The combined sales of the two companies for the 1942 fiscal year amounted to approximately $400,000,000.

The net working capital after suggested renegotiation settlements, as of November 30, 1942, amounted to approximately $9,000,000. This is only about 2.25 per cent of sales in 1942 and less than 1.5 per cent of our estimated sales for the current year. I hope you will keep this figure of $9,000,000 in mind. It is our entire working capital and it is equal to about two weeks' payroll.

On November 30, 1942, Consolidated alone had liabilities and commitments of $546,000,000 against which we had cash, receivables and inventories and Government supply contracts covering our commitments to subcontractors and suppliers. In addition, we had our own working capital of $9,000,000. It is easy to see that this meagre margin of capital to risk is a real problem.

If we were not devoting all our efforts to getting out more airplanes at the lowest possible cost, this would be enough to give us nightmares. I say to you with the utmost sincerity that our stockholders are risking every penny of their capital, up to the hilt, in the war effort. The general belief is that we have been benefited by the immense volume of business which has been entrusted to us. This is far from being the case. Our stockholders and the stockholders of all companies in the aircraft industry would be far better off if their businesses had not been expanded to these wartime fantastic levels.

I have contended in my dealing with the Price Adjustment Board that the profits we asked for were not real profits in any sense but merely an effort, and an inadequate one at that, to cushion the shock of shrinkage which is bound to occur.

Even the most ardent aviation enthusiast—and I am one of them over the long range—cannot foresee anything but a shrinkage of business in the period immediately following the war to a fraction of what it is now. We have been raised to the sky from humble origins. We are going to be cut back to size. Make no mistake about that.

Assuming that we would survive the postwar transition, the aircraft industry would then need capital to develop peacetime products. The airplanes of today are not commercial types. Entirely new designs or major modifications of existing designs must be made.

It costs real money to build a new, big airplane and this money—"seed money" it has been called—must be available in the hands of the aircraft manufacturers if they are to continue in the business. For example, the prototype—that means the first airplane—of a 100-passenger transport would cost around $4,000,000. The tooling to go into quantity production would cost an additional $10,000,000.

I know it is not the intention of Congress or of the Price Adjustment Boards to take aviation business away from those who have done so much to give us the best air force in the world and to deliver it to the automobile companies or other companies with adequate capital after the war. This may well happen and it can only be prevented by leaving the aircraft companies with enough resources to continue in business, to keep at least their pre-war organizations together and to continue applying toward aircraft development the engineering brains and skills which have made this country great in the air. I do not know how to emphasize this point strongly enough.

In the aircraft industry we are concerned not with wartime profits but with the survival of our businesses and any intimation that we are profiteering is bitterly resented.

To get back specifically to the question of reserves, I think it would be

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RENEGOTIATION MENACE

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very helpful if Congress — either through the tax law or through amendment to the renegotiation law — could provide for the postwar transition period. I am sure that the Navy Department's Price Adjustment Board is fully aware and sympathetic with this problem and I am sure that they would welcome instructions from Congress that would permit them to allow reserves.

Members of the Price Adjustment Board are business men. They know what the aircraft industry has done for the war and what it will be up against when the war is over. They interpret the present renegotiation law as not permitting them to allow these reserves, and Congressional clarification appears necessary.

All of our present contracts with both the Army and Navy can be cancelled at any time by the Government if the Contracting Officer determines that it is for the best interest of the Government. The present contracts in effect provide that expenditures up to the date of cancellation will be paid for, plus part of the profit. A final determination under these provisions, however, may well be a prolonged affair, and expenditures made by the contractor in all good faith for the carrying out of the contract might not be allowed in the settlement.

Assume even that all costs up to the date of cancellation are paid, the contracts do not give any protection to the contractor against his real problem; that is operating expenses and losses after the termination date. We go on the theory—and perhaps it is wishful thinking — that our expenditures for Government accounts up to today are covered if a cancellation notice should be sent out tonight. Tomorrow, however, is an entirely different matter. Our operating expenses could not possibly be cut off in time to prevent enormous losses.

As I mentioned before, our net working capital is less than two weeks' payroll, and payroll is only one element of expense. Frankly, I do not know what we could do. A drastic cut off would be chaos in the communities in which we are doing business and, while we hope this method of termination will not be followed, it is possible under our contracts and we must be thinking of it as a possibility.

We would like to see termination provisions written so that they will give the contractor some measure of protection against loss during the period following termination. I do not think this is asking too much.

The story is a long one and I have already taken up a considerable amount of time. I could bring in considerably more information but, as it is, I think I have touched on at least the main points; namely, renegotiation after taxes, reserves for the postwar transition, and the termination of contracts.

Before closing, however, I would like to bring out the accomplishments of Consolidated Aircraft in the matter of price reductions. Early in 1942, before the renegotiation law was even discussed in Congress, it was decided by Consolidated's management that, due to reduced costs brought about by manufacturing efficiency, it would be proper to pass this saving along to the Government in the form of reduced prices.

In April, before the Renegotiation Bill was introduced, Consolidated advised the contracting officers at Wright Field that it was planning to make certain voluntary reductions. In May, the price reductions were made. Further price reductions were made in July and again in September, with the net result that the Government for the fiscal year to November 30, 1942, benefited to the extent of $127,400,000. Of this amount, approximately $41,000,000 was refunded in cash and the balance through reduction in contract prices and waiver of escalator payments due.

All of these returns to the Government were made voluntarily, and this is proof of our willingness to return savings made possible through manufacturing efficiency.

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CAP RULES, March 29, 1943 TRAINING 32 91 CADETS CAP RULES, March

32- **Military** (Continued)

2. **Infantry Drill** Text: War Dept. Basic Field Manual FM 22-5 "Infantry Drill Regulations" GPO 30c. Credit 20 hours, subdivided as follows:

2A 5 hours Chapter 1 of Manual and first 2 sections of Chapter 2 on positions and facings, plus simple marchings.

2B 5 hours Chapter 2, Sec. III; attain proficiency in marchings.

2C 10 hours Drill in formations, to the extent the size of the local unit permits, pursuant to applicable portions of the Manual, especially Chapters 4 and 9. If drill is with arms, learn Manual of Arms, Chapter 3.

1 Nothing is more stimulating to the morale of a military unit than well commanded and well executed drill movements. Read carefully the 2nd paragraph of the Manual on the purposes of drill, especially as regards giving command experience to junior and non-commissioned officers. Every member likely to join the Armed Forces should learn to give commands. CAP training has meant the rapid advancement and the more effective service of many now in the Army.

2 In addition to the 20 hours required for each member, each unit will conduct at least 1 hour of drill per month without additional credit. Time spent on training for Interior Guard Duty (32-5) and Reviews and Inspections (32-6) will be in addition to the 20 hours required for Infantry Drill.

3 A good beginning for a regular weekly unit meeting is to line up the unit promptly for roll call and half or three-quarters of an hour of drill or calisthenics (37-3).

4 Drill with arms if possible. If rifles or shotguns are not available, wooden guns resembling Army rifles can be made. Co-operation of the industrial arts departments of local schools may be solicited for the purpose.

3. **Safeguarding Military Information** 1 hour Text: CAP Training Manual 32-3 CAP Rules, Part 2.

1 People who cannot learn to keep quiet about what they see and hear are likely to be more harmful than helpful to the war effort. This subject, along with Military Courtesy and Discipline, will be thoroughly impressed upon new members on enlistment and often reviewed.

4. **Articles of War** 1 hour Text: CAP Training Manual 32-4 Optional Text: Military Laws of the United States, GPO $2.

1 These are the general terms of service which apply to members of the Armed Forces. It is required that all members become familiar with the Articles, and with certain Rules of Land Warfare which apply to CAP.

5. **Interior Guard Duty** 4 hours Text: War Dept. Basic Field Manual FM 26-5 "Interior Guard Duty" GPO 10c.

1 Many units of CAP have posted guards over airports and aircraft. In local disasters such as floods, CAP members have guarded entire areas.

2 Instruction 1 hour lecture and at least 3 hours practice in the entire guard procedure, preferably at flying fields or buildings that actually may be guarded by the local unit. All members will learn the 11 General Orders by heart.

6. **Reviews and Inspections** 2 hours Text: War Dept. Air Corps Field Manual FM 1-60 GPO 10c; Infantry Drill Regulations, Chapter 9.

1 Lecture; practice thoroughly so the unit will be ready at any time for inspection by a high ranking officer or official.

3. Recruitment policy will be to make each CAPC unit a select corps composed of young men and women likely to be of service to the war effort and deemed the most likely to succeed in aviation among the young people of the community. Each application will be signed by a member of the CAP unit who will attest to the truth of the application and will pledge personal responsibility in assisting the recruit to advance.

1 The preferred method of forming a CAPC unit is for each man in the CAP unit to sponsor one young man for CAPC and each woman to sponsor one young woman.

2 An alternate method is to accept the recommendations of local high school principals or teachers, especially pre-flight teachers.

4. The applicant will be interviewed by the CAPC unit commander, on whose approval he will be accepted as a provisional member of the CAPC unit for 10 hours of training, without uniform, as follows: Civil Air Patrol (31-1), 2 hours; Courtesy and Discipline (32-1), 3 hours; and Infantry Drill (32-2A), 5 hours. Meanwhile he will be subject to investigation as to character and loyalty. After not less than a month's service and on satisfactroy examination in the above subjects by a board of officers of the CAP unit, the applicant will appear before a CAP meeting in correct uniform, will take the CAPC oath, and will be presented his CAPC identification card, bearing his name, CAPC serial number, picture, and signature.

1 Identification cards will be furnished by National Headquarters for issuance by commanders of CAP Squadrons and Detached Flights to Cadets under their command, without clearance by higher units of CAP.

2 Serial numbers, starting with 1, will be assigned to Cadets in the order of their admission as members of each CAPC unit. A number will not be reassigned.

5. A Cadet may resign or may be discharged by order of the CAP unit commander who will endorse the Cadet's identification card as to the nature of the discharge (16-1). A Cadet honorably discharged with favorable notation can be accepted for renewed membership in the same unit or another CAPC unit which, on acceptance, will issue him a new card. Cadets 16 and over may be recommended for membership in CAP (11-0) but will find better opportunities for command experience by remaining in CAPC until graduation from high school.

6. Ratings will not be given to Cadets as a basis for rank as in CAP. Careful records will be kept as to all training courses completed. Examinations by boards of CAP and CAPC officers will be given from time to time as in (17). On discharge from CAPC, a Cadet will be given a rating sheet by the CAP unit commander attesting to the courses he has completed and service rendered. A copy will be sent directly to National Headquarters for permanent file. If the Cadet applies for membership in CAP, he will be credited with all courses completed in CAPC on satisfactory examination by the CAP unit which he joins.

7. Cadets will not hold officer grades. Functional titles and non-commissioned grades, which will be in CAPC and not in CAP, are authorized only as follows:

1 Squadron Commander, First Sergeant.
2 Squadron Staff, who will rank in the order named: Training Sergeant, Intelligence Sergeant, Communications Sergeant, Supply Sergeant, and Adjutant, all in the grade of Sergeant.
3 Flight Leader, Sergeant.
4 Assistant Flight Leader, Corporal.
5 Section Leader, Corporal.
6 Assistant Section Leader, First Class Private.

8. No Cadet will wear chevrons for the above grades until at least three months service in CAPC.

92- Intelligence

0. Intelligence and public relations will be conducted by the Intelligence Officer of the CAP unit to which the CAPC unit is attached. This officer will utilize the assistance of the CAPC Squadron Intelligence Sergeant or if the CAPC unit is a Flight or Section, the assistance a designated member thereof. CAPC Intelligence personnel may prepare material and pictures for placement in school papers or elsewhere, subject to the approval of the CAP unit Intelligence Officer.

93- Training

0. All CAPC training will be pursuant to (3). Cadets will take the same courses as CAP members under the same standards of instruction and examination. Qualified Cadets may be designated as instructors.

1. Flight training will be optional for Cadets.

1 No Cadet under 16 will be carried aloft or will enter or approach an aircraft with the engine running.

2 A Cadet 16 or over may fly or may enter or approach an aircraft with the engine running only if he files with the CAP unit written consent from parent or guardian.

94- Operations

0. Cadets will not participate in CAP operations except by order of the National Commander in emergency. They may participate in volunteer missions on assignments such as guard duty or in CAP practice missions, meetings, and mobilization by order of the CAP unit commander and on such duty will be under the orders of such CAP or CAPC officers as he may assign over them.

95- Equipment

0. Equipment and facilities will be used by CAPC pursuant to (5) and under the custody and direction of the CAP unit commander.

96- Supply

0. Orders for insigina and supplies will be prepared by the CAPC Squadron Supply Sergeant or by a designated member of a CAPC Flight or Section for transmittal to the supply source by the CAP unit Supply Officer (4) who will issue the supplies to the CAPC unit.

1. The uniform of a CAP Cadet will consist of the following garments as prescribed for enlisted men of the Army: khaki or chino shirt without shoulder loops; black tie; khaki or chino trousers (skirt may be worn by girl members); web belt with plain buckle; plain tan shoes; plain tan socks; and garrison cap with red piping as prescribed for CAP. The field jacket is optional. Civilian outer garments may be worn in cold or rainy weather. Otherwise no items of civilian wear will be worn with the uniform and portions of the uniform bearing insignia will not be worn with civilian garments. The cap with visor will not be worn. No uniform item other than those above named will be worn.

2. Insignia will be worn by all Cadets as follows:

1 CAPC emblem, cloth: red 3-bladed propeller on white triangle on 2¾" blue disc, same as CAP emblem without the "US" and with "CADET" added below in red letters on white background sewn on the left sleeve of shirt and field jacket, ½" below the shoulder seam.

(¼ actual size)

2 Silver CAPC pin: 1½" long in letters ⅜" high; worn centered above the right shirt pocket with the bottom of the letters ¼" above the top of the pocket flap.

(actual size)

3 CAPC cap emblem, cloth: red 2-bladed propeller with white wings on a 1¼" blue disc; sewn on the left side of the garrison cap, 1" from the front and half way between the top and bottom of the cap.

(¾ actual size)

3. Insignia for CAPC officers are authorized as follows:

1 Functional titles, cloth, optional for Squadron Commander, Squadron Staff, and Flight Leader: white letters ½" high woven on blue fabric to be sewn on the left sleeve centered ½" below the CAPC emblem.

2 Chevrons, cloth, for grades prescribed in (91-7): khaki on red background same as prescribed for CAP, sewn on both sleeves half way between the shoulder seam and the elbow.

4. On civilian garments, CAP Cadets will wear no CAP or CAPC insignia except the small winged lapel emblem prescribed for CAP.

97- Finance

0. A CAPC unit may maintain a fund as in the case of a CAP unit (7) subject to instructions of the CAP unit commander.

98- Miscellaneous

0. Each CAP unit commander will report through channels each month as to the number of Cadets and the general status of Cadet organization and training under his command.

99- Pre-Cadet Training

0. CAP unit commanders at their discretion are authorized to co-operate with public schools and with the Boy Scouts of America by furnishing instructors and by enlisting teachers and Scout Leaders in CAP for training.

Note: Supply sources for CAPC insignia include the following:

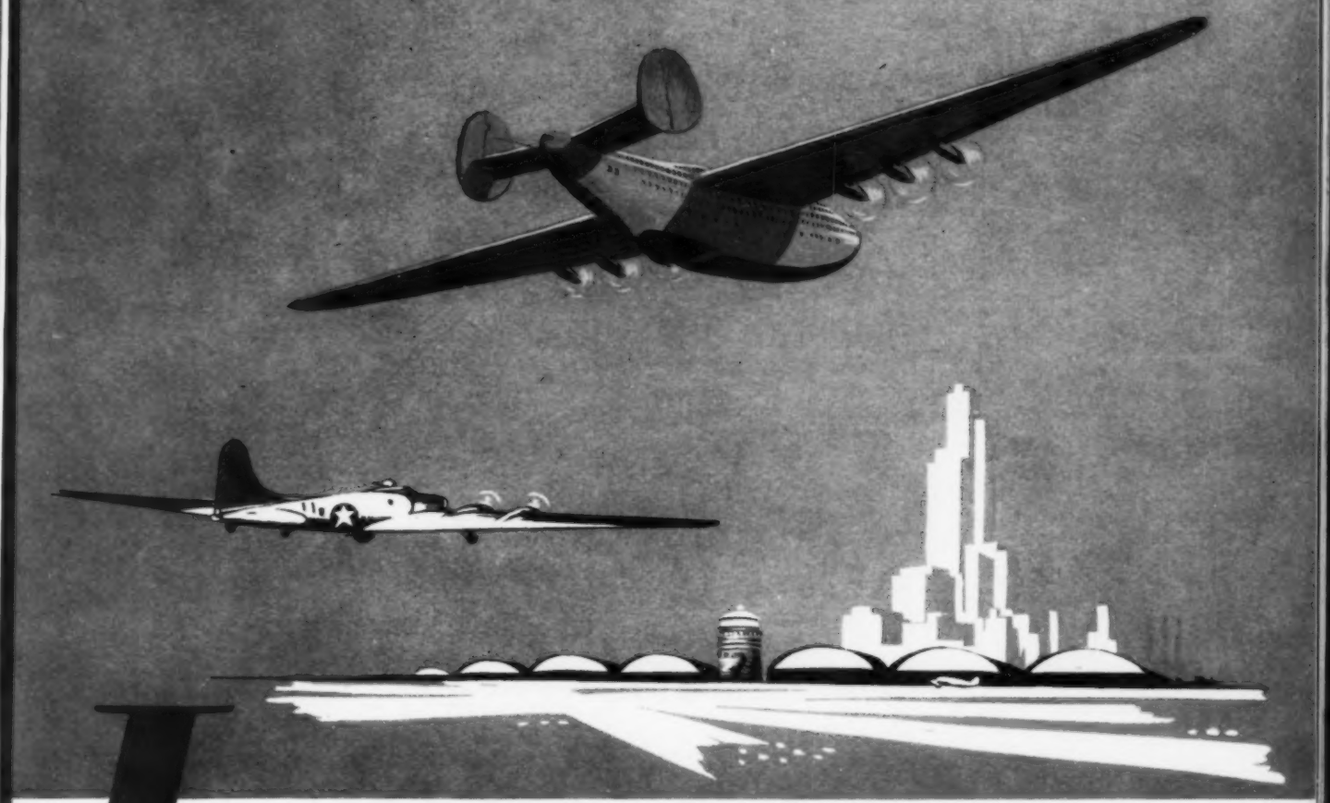
Gemsco, 395 4th Ave., New York City—CAP sleeve emblem, 25c ea. (Minimum order 6 pieces)—CAPC cap emblem, 15c ea.

Robbins Co., Attleboro, Mass.—CAPC silver letters, 65c ea. (Minimum order 3 pieces)

Other CAPC items, which are the same as specified for CAP, may be obtained from the sources listed in addenda to Part 6.

48b

THERE IS A FORECAST OF *Tomorrow*



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Description	Cat. No.	Length Overall	Length from frt. of panel	Mounting Hole	Max. Current Amps.	How Operated	Use with fuses (applications)
Aircraft Fuse Mounting Extractor Posts for 4 AG Fuses (9/32" dia. x 1¼" long)	1212	2⅜"	2¼"	⅜"	40	Screw Driver (Undw's. Spec.)	Aircraft radio circuits, protecting vacuum tubes; transformers, motor generators, lighting, small motor circuits and many other general aircraft circuits.
	1212-B	2¾"	2¼"	⅜"	40	Finger	
	1212-C (Installed from rear of panel.)	2¾"	2 3/32"	⅜"	40	Screw Driver (Undw's. Spec.)	
Instrument Fuse Mounting Extractor Posts for 8 AG Fuses (¼" dia. x 1" long)	1087	2⅛"	2⅛"	½"	15	Screw Driver (Undw's. Spec.)	Meters and delicate instruments, Radio "B" circuits, thermocouples, test equipment, small rectifier and power tubes and for general instrument protection.
	1087-A	2⅛"	2⅛"	½"	15	Finger	
Fuse Mounting Extractor Posts for 3 AG Fuses (¼" dia. x 1¼" long)	1075	2½"	2⅛"	½"	15	Screw Driver (Undw's. Spec.)	Radios, auto radios, amplifiers, fractional H.P. motors, magnets, control circuits, relays, rectifiers, plate circuits, etc.
	1075-A	2½"	2⅛"	½"	15	Finger	

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NEWEST CARGO PLANE is Waco's C-62, all-wood and having a gross weight of 33,500 pounds. This compares with the Lodestar's 18,500 pounds, the DC-3's 25,200 pounds and the Caravan's 35,000 pounds. Waco is driving to finish the first C-62 by September 15.

C-W and Martin Challenge Truman Accusations; Report Praises Records of Numerous Types

Abundant criticism and curtly-worded praise concerning the aircraft industry's huge production program was contained in a thirty-page report issued last month by the Truman Committee of the Senate, after which U. S. attorneys filed civil action in Trenton, N. J. and Cincinnati, Ohio, courts seeking damages from the Curtiss-Wright Corporation and several of its officials.

A "fight to the finish" was promised by Vice President and General Manager Myron B. Gordon of Wright Aeronautical Corporation, who denied the firm delivered defective engines to the government, and President Guy Vaughan of C-W described the Truman attacks as "false and unwarranted."

Although Curtiss-Wright was the target for most of the report's criticism, the Glenn L. Martin Co. was also singled out. Martin's B-26 was viewed as liked by most pilots who fly it but, because of landing and take-off difficulties and its "high cost of production and maintenance," the Army "plans to taper off its production and to use the Martin facilities at Baltimore, Md., and Omaha, Neb., to produce other types of planes." In the cargo field, the report charged, the Martin Mars is "relatively worthless" because of its many bulkheads and "has not yet been put to any practical use." To which Martin answered: The B-26 is a high-performance type, safe in the hands of experienced pilots, and many combat pilots have said they prefer it to other types; as for the Mars, the only trouble found with it has been its engines, which are government furnished, and the Mars is today beached, waiting for new engines. Martin added: "In eighty-five hours of flying it (the Mars) has proven it can carry more weight for greater distances than any other airplane in existence and that it is the most efficient aircraft per pound of material, per horsepower and per gallon of fuel yet known."

North American's B-25 was described as a "very valuable plane" and is in "very substantial production," and NAA's P-51 Mustang was viewed as "superior to either the Bell Airacobra or the Curtiss P-40," characterized by both the British and the AAF as the "most aerodynamically perfect pursuit plane in existence." Republic's P-47 is a good high altitude fighter, said the report, but the Army was "slow to recognize the value of this plane, because of the Army's primary interest in low altitude planes, such as the Curtiss P-40." Lockheed's P-38 has "proved to be a very fine plane." "Exceptional performance" was credited to Grumman's F6F Hellcat and Vought Sikorsky's F4U Corsair.

Douglas' A-20 Havoc is "one of the best-liked planes built in this country," and Douglas SBD and A-24 dive bombers have carried the brunt of Uncle Sam's dive-bombing work to date.

Mention of Curtiss-Wright's dive bomber, the Army A-25 and the Navy SB2C, stirred the Committee to renewed criticism of the Corporation and its alleged "inability to produce usable planes." Millions, charged the Committee, have been "wasted" on Curtiss-Wright's Helldiver program. The Curtiss P-40 was described as "inferior" to other U. S. fighters and was relatively obsolete at the beginning of the war. At one time the Army ordered substitution of Republic's P-47 for the P-40 in the Curtiss-Wright plant, but later ordered continued P-40 production, the report stated.

Criticizing the issuance to C-W of huge war contracts, the Committee said one large order was for a new Curtiss fighter to be known as the P-60, but the model has been "discontinued." Moreover, it was charged Curtiss-Wright was given one of the four experimental contracts for the development of two-engine fighters "despite its lack of success in the field and the success of the Lockheed P-38."

Regarding Wright Corporation's engines, the Truman Committee charged Wright's Lockland, Ohio, was "producing and causing the government to accept defective and substandard material." Involved in this, it was alleged, was the overriding of company and Army inspectors.

All charges against Curtiss-Wright and Wright were categorically denied by officials of the firms.

Firestone Acquires G&A and Rotary Wing Licenses

The Firestone Aircraft Company of Akron has acquired G&A Aircraft, Inc., at Pitcairn Field near Willow Grove, Pa., and has obtained a license from the Autogiro Company of America of 200 patents covering development of rotary wing aircraft including autogiros and helicopters, Harold F. Pitcairn, president of the Autogiro Company, announced recently. The G&A Company, successor of Pitcairn Autogiro Company, in collaboration with the Autogiro Company of America has developed recently a new military autogiro for the U. S. Army, details of which are still secret. A number of jump-off or self-catapulting autogiros developed and manufactured by the G&A Company have been delivered to the British Government.

Damon Returns to AA; Marchev Heads Republic

A "loan" agreement between American Airlines and Republic Aviation Corporation, whereby Ralph S. Damon, AA's vice president in charge of operations, became president of Republic on May 1, 1941, will be ended on August 31 when Damon returns to American. He resigned from Republic recently, having accomplished his goal—steering Republic into efficient management and quantity production.

Alfred Marchev, executive vice president, will be Republic's new president.

Wooden C-76 Abandoned; Higgins, C-W to Build C-46

Abandoning the all-wood Curtiss C-76 Caravan transport, the Army has substituted contracts with Curtiss-Wright's Louisville plant and Higgins Company at New Orleans for production of the all-metal Curtiss C-46 Commando. Scarcity of critical materials has been alleviated by increased aluminum production, while wood necessary for the C-76 transport has become scarce and would be more costly and less efficient than metal construction, the Army declared. It is understood Reynolds Metals Company's aircraft parts division already is tooled for C-46 parts adequate to expedite the change-over at Curtiss-Wright in Louisville and at Higgins in New Orleans.

Sixteen Airlines Declare Plans for International Expansion; Hit "Monopoly"

Sixteen major American airline companies on July 15 announced plans for world-wide air routes and submitted a declaration of policy to the Civil Aeronautics Board for expansion of international air transportation on a competitive basis and opposing monopolistic influences in air transport. The five principles declared in the statement to CAB were: (1) free and open competition—world-wide, (2) private ownership and management, (3) fostering and encouraging by the Government of the United States, (4) freedom of transit in peaceful flight—world-wide, and (5) acquisition of civil and commercial outlets required in the public interest. The air routes proposed would run abroad from the East and West Coasts, Northern and Southern boundaries.

Pan American Airways, only international airline until two years ago, did not sign the declaration, nor did United Airlines. The signatories were: American, Braniff, Chicago & Southern, Continental, Delta, Eastern, Inland, Mid-Continent, National, Northeast, Northwest, Pennsylvania-Central, Transcontinental & Western, Western, All American, and Continental.

73,132 Planes to AAF During Eighteen Months

The Army Air Forces announced recently it is receiving new airplanes at the rate of about 4,500 monthly and has received, in eighteen months, ended July 1, a total of 73,132 planes of all types. Up to June 30, 1943, allotments to the AAF totaled $40,000,000,000, all of which has been obligated, and of which 85 per cent was for airplanes, engines, propellers and spare parts.

The figures were released on the thirty-fourth anniversary of the Army's purchase of its first airplane, when a Wright biplane was accepted.

Beech Doubles Output; Research Programs Under Way

Beech Aircraft Corporation, Wichita, Kansas, had greater production during the first six months of its 1943 fiscal year than its entire 1942 fiscal year. Walter H. Beech, president, stated that under present schedules, production for 1943 will increase 100 per cent over 1942.

Beech said experimental and research work is continuing apace, indicating new developments for military production and postwar output. "During the month of April," he added, "Beechcraft had the lowest absenteeism of all the aircraft manufacturers in the United States."

Fairchild Bringing Furniture Plants Into Aviation

Development of plastic-plywood trainer planes, such as the two-engined Fairchild "Gunner," has permitted direct participation in the aircraft building program of the furniture industry. Sixty per cent of the Fairchild "Gunner" is to be made by subcontractors, the largest of which is Drexel Furniture Co. of Morganton, Drexel and Marion, N. C. A special aircraft department and training school for their workmen, largely skilled woodworkers, has been set up by Drexel. Drexel holds contracts to make outer panels, flap assembly, stabilizer, fin assembly, floor boards, side windows, escape hatch, bomb-bay doors, nose wheel door, rear fuselage and scoops for the "Gunner."

Ninety-one Coeds Training Under Hamilton Standard Scholarships

Hamilton Standard Propellers division of United Aircraft Corporation is training ninety-one young women on special scholarship courses at Pennsylvania State College to enter their engineering offices upon completion of their studies. The girls, half of whom are taking six-months' courses, and the other half a full year's work, receive scholarships with all tuition, board, lodging and allowance for other expenses. In return, they give a one-year's option to do engineering work at Hamilton Standard. Courses include aerodynamics, chemistry, drafting, designing and basic engineering courses.

C-W's Missouri Plant Pre-tests Accessories

Special equipment and fixtures for testing the proper functioning of warplane accessories before they are installed in the plane, which save time, cost and materials, have been put into use by the Missouri plant of the Airplane Division of Curtiss-Wright Corporation. The new method does not require skilled mechanics and technicians for engine and electrical units. Under the pre-set system in which aircraft accessories are set to the correct limits before becoming a part of the plane, operators are trained to test these parts on the new fixtures in limited time. Checking of all accessories on the special equipment eliminates both possible removal from the plane and the large amount of plane engine operation formerly required.

The time saved is indicated in that formerly pre-setting the generator voltage regulator for a warplane required one hour under engine power, while now a regular unit is checked and set in twenty minutes without engine run or further adjustment after installation.

Goodyear Modifies B-24's

Goodyear Aircraft Corporation at Phoenix, Arizona, has started on modification of Liberator bombers for the Navy, and crews of Goodyear workers have been assigned to the Tucson division of Consolidated Vultee. The plane, known as PB4Y-1, will be a land-based bomber.

Brazil Completing Wright Plant Near Rio de Janeiro

A mammoth, modernly-equipped plant at Baixada Fluminese near Rio de Janeiro to produce seven and nine-cylinder Wright Whirlwind aircraft engines is nearing completion, Dr. Joaquim Pedro Salgado, air minister of Brazil, announced recently. The new plant, which Wright Aeronautical Corporation has aided as advisor and in training of personnel, will be the first aircraft engine manufacturing organization ever formed in Brazil, Dr. Salgado stated, and will be the nucleus of a small but complete "city." The factory, to be operated under the name Febrica Nacional de Motores, is of the latest modern design and equipment, including air conditioning, blackout facilities and a foundry. A community surrounding the plant includes living quarters for workers, hospital, theater, fire department station and hotel. An air field is also being constructed adjacent to the project.

Wing Cannon Added To Mustang's Armament

Some P-51 Mustangs recently produced by North American Aviation are equipped with four twenty-millimeter cannon, making the airplanes capable of exploding locomotives and destroying small merchant ships while retaining their qualities as fighters. Installation of the twenty-millimeter cannon in the Mustangs demonstrated for the first time that a number of big guns could be used successfully in a fighter without causing "bumps" in the surface of the wing. Two Mustang pilots of the Royal Canadian Air Force reported recently that in slightly more than thirty minutes they accounted for a round dozen railway engines. The War Department has disclosed that another model of the Mustang is powered with the Rolls-Royce engine manufactured by Packard.

Loening Heads Helicopter Committee for NACA

The National Advisory Committee for Aeronautics has confirmed the appointment of Grover Loening, consultant on aircraft of the WPB, as chairman of its subcommittee on helicopters, under the NACA committee on aerodynamics.

Dreyfuss With Convair

Henry Dreyfuss, industrial designer, has been appointed consultant in the design of aircraft for Consolidated Vultee Aircraft Corporation. Mr. Dreyfuss' designs have been incorporated in General Electric refrigerators, Westclox clocks, Hoover vacuum cleaners, New York Central's 20th Century Limited, Sears, Roebuck washing machines, Deere tractors and farm implements, Royal typewriters, Crane plumbing fixtures, Goodyear tires and American Export Airlines planes.

Taylor Representing Douglas

Irving H. Taylor, formerly general manager of the Aeronautical Chamber of Commerce of America, has been appointed Eastern representative of the Douglas Aircraft Company, Inc., with offices in the Shoreham Building, Washington, D. C.

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Products Output Gaining

Two Detroit plants of Republic Aircraft Products, division of The Aviation Corporation, increased their production for the first half of the 1943 fiscal year 25 per cent over production for the last half of 1942, and almost doubled the output of the first half of 1942. By October 1, Republic expects their monthly production to equal half of their production for the first six months of 1942.

Aircraft Accessories Adds Another

Aircraft Accessories Corporation has acquired controlling interest in the Phonette Company of America, a Los Angeles radio components manufacturing concern, it was recently announced. Phonette will be operated as a subsidiary under the Electronics Division of Aircraft Accessories. The Electronics Division operates nine plants in Kansas and Missouri, producing radio equipment for aviation.

No Shortage of Starters

Eclipse-Pioneer division of Bendix Aviation Corporation set a new production record in May by delivering to the armed forces enough aircraft engine starters to equip 10,000 planes, Kenneth MacGrath, general manager, recently announced. MacGrath stated production of aircraft starters doubled that of the same month a year ago, and the starter ouptut for the first five months of 1943 doubled that of the same period last year. While delivering since Pearl Harbor enough aircraft starters to equip more than 100,000 planes, Eclipse has given three price reductions on their starters, totaling 20 per cent of original contract prices, MacGrath added.

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With the Parts Makers

Member companies of Aircraft Parts Manufacturing Association, Los Angeles, have recently announced changes in their personnel. Doak Aircraft Company, Inc., Torrance, Calif., has installed an instruction program for new employes, headed by JACK McFALL. BANNING GARRETT of Doak Aircraft has been promoted to assistant industrial relations director. Grayson Heat Control, Ltd., Lynwood, Calif., has appointed FINDLAY CARTER director of industrial relations. JAMES BANNISTER of Harvey Machine Company, Los Angeles, has been promoted to assistant director of personnel for the Los Angeles and Long Beach plants. ROBERT W. LIMACHER of Interstate Aircraft and Engineering Co., Los Angeles, has been appointed assistant to the executive vice president. New personnel directors for Interstate are FRANK DOWNEY El Segundo and FRANK SMITH at Los Angeles. J. H. ANDES has been promoted to night superintendent of Poulsen and Nardon, Vernon, Calif. JAMES CLARK has been appointed supervisor of plant protection at Thompson Products, Inc., Bell, Calif., TOM DE VAULT has been named employment manager at Thompson Products, and S. A. RICHARDS has been selected to fill the recently created post of plant buyer of Thompson Products. PAUL H. FORD of Vard's Mechanical Laboratory, Inc., Pasadena, Calif., has been promoted to general manager.

NEW OFFICE and warehouse of the Keystone Tool and Supply Company, Dallas branch, has been opened at 1901 Canton Street. During the first six months of 1943 production has been doubled over that of 1942, according to H. L. Hutchinson, branch manager.

National File Service Reorganized at Houston

The National File Service, Inc., Houston, Texas, has been reorganized. New officers are Curtiss Kelly, president; Don McGregor, vice president and general manager, and O. V. Tatum, secretary and treasurer.

National is known to the industry for its service of renewing files and rasps, a service important in the salvage. Their service covers the entire United States.

New D. C. Consulting Service

H. E. Weihmiller, formerly vice president and Eastern representative of Consolidated Aircraft Corporation, has opened Aircraft Consulting Service at 618 Shoreham Building, Washington, D. C., as an independent business and technical service for companies and persons engaged in aircraft and associated activities.

Worker Recruiting Film Ready

"Fortress in the Sky," a three-reel Kodachrome film on Boeing's Flying Fortress, to be used in recruiting war workers, will be released in September, and can be secured by all groups interested in aviation by application for booking to The Princeton Film Center, Princeton, N. J.

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NEW PRODUCTS

An all-purpose contour and cut-off band saw (Fig. I) for wood or plastic stock up to eight and five-eighths inches thick has been announced by Boice-Crane Company of Toledo, in bench and floor models. The throat allows twenty-seven-inch diameter cutting. The framework is a solid one-piece steel structure. The wheel guard swings on a single hinge. The telescoping guard on the blade holds by friction when the lock handle is released. The degree of tilt is indicated by an accurate scale. The Barber-Colman Company of Rockford, Illinois, has announced a polarized direct current voltage sensitive relay (Fig. II), known as a "Micropositioner" for remote positioning of control motors, and control of air valves, engine cowling flaps, trim tabs and other aircraft installations. A new aircraft circuit breaker (Fig. III) developed in capacities of 80-90-100 and 125 amperes at thirty volts D. C. has been developed by Square D Company, Regulator Division, of Detroit. The combination of toggle switch and circuit breaker in single sealed unit saves weight, space and wiring time.

New Template Dies

A faster method of manufacturing blank and pierce dies to meet the demand of aircraft and other industries, saving one-fourth the time and reducing the cost approximately 65 per cent, was recently announced by Algoma Products of Detroit.

Dies are produced from templates of the parts, eliminating special die designing, and the construction simplifies alterations due to engineering changes. The dies are contour-sawed from chrome molybdenum steel, filed, sheared to size, hardened and welded to back-up plates. One-third of the critical alloy steel formerly required is conserved.

Northrup Leads Industry in "Suggestions" Honors

Northrup Aircraft's War Production Drive Committee leads the airframe industry in honors awarded by the WPB for ideas to speed production, and ranks 11th among the 2,200 WPD committees now functioning, according to the company. Northrop workers have received one citation, five certificates of production merit and nine honorable mentions. Over 1,400 suggestions for speeding production were turned in at Northrop during the past fourteen months, and of these, 129 have been put into operation. More than 600,000 suggestions have been reviewed by the WPB headquarters in Washington since April, 1942, and eleven citations, 201 certificates and 434 awards have been made.

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Lea Expects Action on HR 1012 Soon; Summary of Provisions Given

H. R. 1012, to amend the Civil Aeronautics Act of 1938, is expected to be reported to the House "within a reasonable time" after Congress reconvenes September 14, Chairman Clarence F. Lea of the House Interstate and Foreign Commerce Committee announced recently. He said "committee print No. 3" of the bill had been made public and interested persons have been invited to make constructive suggestions.

Chairman Lea summarized the main provisions of the bill, as it now stands, as follows:

First: The name of the Civil Aeronautics Board is changed to that of the Civil Aeronautics Commission. The Commission is given an independent status and clothed with quasi-legislative and quasi-judicial powers. The Administrator is also taken from the Department of Commerce and given a more independent status.

The bill clearly defines the duties of the Commission and the Administrator in relation to each other. The Administrator is charged with duties as to such matters as the construction of air navigation facilities, and many other administrative matters. In performing the more important of these duties, the Administrator will act under the supervision of the Commission.

Second: The bill provides for a Director of Air Safety and restores accident investigations to an independent status under such director.

Third: It proposes an investigation and report by the Postmaster General and also by the Civil Aeronautics Commission as to the feasibility of carrying all classes of mail by air when delivery would thereby be speeded.

Fourth: It calls for an investigation and report by the Civil Aeronautics Commission, furnishing information with suggested plans for meeting postwar developments in civil aviation.

Fifth: It provides for a broad program of aviation training and education.

Sixth: It proposes a long-range program under the direction of the Administrator of Civil Aeronautics for the development of air navigation facilities including airports.

Seventh: It provides a plan for protecting the safety of flight by furnishing a means for removing or preventing hazards to air navigation on and in the vicinity of airports.

Eighth: It extends and further defines Federal jurisdiction respecting air navigation and air commerce.

Ninth: It strengthens our national policy with respect to the development of air transportation and the protection and promotion of air navigation.

Tenth: It contains more strict provisions against the issuance of passes in air transportation.

Eleventh: It provides for reasonable compulsory extension of air-line service, particularly in the foreign field.

Twelfth: It brings contract carriers by air under economic regulation.

Thirteenth: It has provisions designed to prevent the growth of interstate trade barriers to commerce by air.

Fourteenth: It provides for a study of multiple taxation of persons engaged in air commerce and of their employes in order to develop recommendations to prevent the growth of unjust and unsound tax policies for civil aviation.

Fifteenth: It introduces numerous improvements in the administrative procedure under the Civil Aeronautics Act.

Sixteenth: It provides for strengthening and expanding the Weather Bureau service in aid of our air navigation, both domestic and international.

Seventeenth: It codifies civil aviation law by bringing isolated legislative provisions into the Civil Aeronautics Act.

Eighteenth: It gives the airman in command of an aircraft, or other authorized employes, adequate power to assure safety and prevent disorderly conduct.

Nineteenth: It calls for an investigation and report by the Civil Aeronautics Commission as to matters affecting aviation insurance and reinsurance.

Twentieth: It makes clear that all employes of air carriers are subject to the Railway Labor Act and it extends that act to contract carriers by air and their employes.

Twenty-first: It provides for the co-operation of local, State, and Federal authorities in the promotion and co-ordinated operation of air transportation.

Shealey New Globe Manager

Harry M. Shealey, formerly factory manager of the Glenn L. Martin plant at Omaha, and associated with the Martin Company since 1930, is now assistant vice president in charge of production for Globe Aircraft Corporation, Fort Worth, Texas.

LAST HUDSON built by Lockheed is shown above through a fuselage section of the Constellation, which is taking the Hudson's place on the assembly line. Vice President Richard A. Von Hake (right) is shown watching the last "Boomerang" roll from the line.

Refrigerated Transports Viewed as Practical

Fleets of giant refrigerated cargo planes to carry produce around the world and aid the postwar food problem were predicted recently by S. E. Lauer, president of the York Corporation. Lauer stated refrigerated air freighters are now possible because of the higher efficiency of refrigerants and decrease in size of equipment, developments caused by war needs.

New AAF Plane Insignia

New insignia for U. S. Army planes has been adopted to improve identification from Nazi cross and Japanese sun, the War Department recently announced. A white rectangle at right and left is added to the blue circle with white star, and a red border surrounds entire design. The new insignia is visible at 60 per cent greater range than former insignia.

North American Recruiting Disabled War Veterans

A plan to employ all disabled veterans of World War II as soon as they are discharged from Army or Navy hospitals, to be used as inspectors, follow-up clerks, burr bench workers, and in sections where their disabilities will be no handicap, has recently been announced by North American Aviation, Inc. A disabled veteran will be interviewed by the U. S. Employment Service before leaving the hospital, and will be referred to the U.S.E.S office nearest his home, which will determine the nearest aviation plant for him. North American will interview for aptitude, experience and training, and place him in the type of work for which he is most suited.

Two Army Glider Trains Fly 1,243 Miles Nonstop

A new world's distance record for towed gliders was established July 18 by two "trains" of Douglas C-47's and Ford-built CG-4A gliders, loaded to capacity, which flew nonstop 1,243 miles from Sheppard Field, Texas, to Lauinberg-Maxton Army Air Base, North Carolina. The recent British trans-Atlantic glider crossing was made in several stages, longest of which was 1,177 miles.

Bowen Seeks Routes

An airlines system to serve 101 Mid-American cities, covering 14,300 miles, has been proposed by R. C. Bowen of Fort Worth, president of Bowen Motor Coaches and pioneer in commercial aviation, and application for postwar operation has been filed with the Civil Aeronautics Board. Bowen, president of the old Texas Air Transport Company, stated the proposed "Bowen Airways," incorporated for $2,000,000, would operate out of Fort Worth to such points as New Orleans, Brownsville, El Paso, Salt Lake City, St. Louis, Kansas City and Memphis.

Mooney Leaves NATA for Parks

C. R. Mooney has resigned as secretary of the National Aviation Training Association to become personal representative of Oliver L. Parks, president of Parks Air College, East St. Louis, Ill. John Wilson of Lockport, Ill., was elected executive director and the title of secretary treasurer passes to Mrs. Ena L. Pugh, who has been office manager in Kansas City. Mooney was appointed chairman of the NATA legislative committee.

By TONY HAGMANN,
Field Representative

Dallas Texas—Quoting Jack Story, now with Guiberson, it's hot as a depot stove and getting hotter. Major Bill Long went to the high hills to cool off, which we think is a good idea in spades.

A couple of carpetbaggers have been seen about ole Dallas from the companies, Lockheed and Vega. Harry Shuhart, a self-styled wolf, George Adair, Jr., wolf, and Del Schell, all from the orange pickin' state, are the guilty parties. Wouldn't they be called designing engineers?

Disconnected notes: Bill Cummings, Wright Field, hit the city; so did Major George Haddaway (SOUTHERN FLIGHT'S G. H.), Oscar Wortman, Aircraft Steel, Wichita, and Eugene McCurdy (CAA). Eugene reported that the Art Wintheisers are out at Artesia, New Mexico. The Masons—Barbara and Tommy—of Lockheed Vega are still waiting for the stork and if he knew about the baby pool, he'd hurry. Captain P. R. Lindemann (5th Ferrying) has been transferred to Cinci . . .

At Hampton—103 in the shade . . . Frankie Lovvern ..olding down the deal, the Millsaps off to take care of a little night flyin' in Austin, Alan Bayse said his first howdy in a long time, Bill Campbell working like a beaver, "Bugger Red" Vincell off to Ark. . . . and a couple of WAF candidates were working up time. Winifred Wildman and Hivernia Swain, Dallas fems after the WAFS deal.

It's as hot as a two-dollar pistol.

Birmingham, Alabama—Harry Hoile of the Birm. Aero Club, sent us the news of Major Jos. C. Mackey's attendance at the monthly meeting. The Major is sole survivor of a transport crackup in Newfoundland and was scheduled to give out with some details. He and Capt. W. P. Yates (pub. rel. 70th Sq. Ferrying Command) were flying from Nashville just to take care of that nice piece of talking business. Gene Royer from Fort Worth and Tommie Thomas announce the opening of an Aircredit office here (sales talk, sales talk). They will finance flying, or buyin' a plane or a car . . . something new in the aviation credit business.

Austin, Texas—short short . . . July 5th, the CAA opened a control tower for air traffic at the Municipal Airport. Little Ellen D. Brooks sent us the news. . . . She's one of the operators, and a private pilot, too.

Enlist CIVIL AIR PATROL in your

Gainesville, Texas—At Camp Howze, the grasshopper pilots of the artillery do some fancy low altitude flying, as do all aerial grasshoppers. One Lt. Alfred Sweet, who is Division Air Officer, was heard to say, "We do some high flying, too, sometimes as high as 500 feet" . . . They fly "T" crafts and Cubs and so close to terra firma the old gag about flying with one foot on the ground could be dusted off and used.

Kansas City, Mo.—Marion Melcher reports: The postwar period has been receiving much attention of late, and the Chamber of Commerce is not the least of those interested. Consequently, the Aviation department conducted a round-table session to which it invited 125 high school and grade school teachers. Richard C. Murray, aviation commissioner, directed questions from the floor. Speakers and subjects included: E. Lee Talman, vice president of TWA, "Air Transportation"; H. A. DeShong, assistant manager of the North American Aviation Corporation plant in Kansas City, "Aircraft Manufacturing and Postwar Conversion"; W. A. Ong, president of Ong Aircraft, "Private Flying and Training"; Arthur C. Everham, director of public works, "Airports"; W. E. Kline, regional manager, CAA, "Air Safety and Regulations".

Grandview Airport is beginning to look aeronautical. The first of its runways, a 4,000-foot southeast-northwest strip, was completed early in May. The middle of July saw the finish of the second runway, 5,500-foot northeast-southwest. A couple of "bugs" have to be plucked to start construction of the $120,000 planned terminal.

On July 5th special air mail was flown by the local unit of the CAP, Moberly, Missouri, from the new Omar N. Bradley Airport, named after Lt. Gen. Bradley, first commander

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BENDIX SCINTILLA

Meacham Field — Fort Worth, Texas

of the American forces in this war to demand and receive from a unit of the German army "unconditional surrender — immediate compliance." The dedicatory address was delivered by Brig. Gen. Paul B. Clemens of the HQ Staff of the 7th Service Command at Omaha.

It was a ration-unconscious Annual Picnic that the members of the Kansas City Unit of the WNAA enjoyed in the home and garden of Lieut. Esther Wirthman (CAP) on July 14th. Miss Dorothy Schnitzer, recently evacuated from Hawaii, spoke of her experiences as a hospital secretary at one of the large sugar-cane camps . . . Miss Marion Newell, Governor-at-Large for the National WNAA, and immediate past National President, left the day before the picnic, having been selected for officers training with the Marine Corps.

How about you all sending us a penny post card with some home town flyin' news, we just can't get around much any more . . .

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BOB TRADER AERO SUPPLY

Municipal Airport, Pittsburgh, Penna.

Aircredit Opens New Office in Birmingham

Tommie Thomas

Aircredit, Inc., Ft. Worth, Texas, has opened a new office located at 110 South 20th Street, Birmingham, Alabama, under the management of G. E. "Tommie" Thomas, it has been announced by Gene Royer, executive vice president of Aircredit. Mr. Thomas has been connected with the finance business for many years in the Southeastern part of the country and is well known in aviation circles.

Oklahoma Wing Tells All About Col. Earle Johnson

What kind of a fellow is Lt. Col. Earle Johnson, national commander of the Civil Air Patrol? A lot of people in and out of CAP are praising him for his accomplishments. But the Oklahoma Wing in a recent press release analyzed him in detail as follows:

Col. Johnson is "the man whom the pilot in the sticks points to as the guy who is keeping civilian aviation alive today, praise allah . . . the big fellow who talks with a soft voice and ducks his head when he walks through a doorway . . . the master mind that has kept the puddle-jumper in the air . . . getting hard jobs done is just part of this big-boned fellow's make-up . . . It was David S. Ingalls, his business associate and Navy ace, who first vaccinated Col. Johnson with aviation and gave him his flying time . . . Now he has over 1,800 hours and on official CAP business flies military planes. . . Col. Johnson was born at Great Barrington, Mass., on January 29, 1895. In 1900 his family moved to a farm near Painesville, Ohio, which he still owns and operates.

Attention!

CAP MEMBERS

SOUTHERN FLIGHT's CAP Directives, formerly inserted in ALL copies of the magazine, are now included ONLY in the CIVIL AIR PATROL EDITION going to subscribers who are in the CAP.

It is possible that a number of SOUTHERN FLIGHT subscribers have not advised this office of their CAP membership. As a result they may receive the regular edition instead of the Civil Air Patrol edition. If this happens to YOU — and you want the CAP Directives — please notify us promptly and we will change your mailing accordingly.

PLEASE NOTE—The CAP edition differs from the regular magazine only in the insertion in it of the CAP Directives. All of the regular features appear in both editions.

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